VHS-C Camcorder

VKR6870/20
68VKR70/40

Service
Service
Service

45 636 A

Service Manual

VHSC
PAL

VKR6870/20 Consists of:

-VKR6870/00	Camcorder
-SBC5423/00	AC Adaptor
-SBC5218/00	Recharge battery
-SBC5425/00	Carrying strap
-SBC5505/00	AV Eurocable
-22AV5054/20	Filter set up ring
-CR2025	D/T Back up battery

68VKR70/40 Consists of:

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-CR2025	D/T Back up battery

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CS 35 311

Specifications

Format : VHS-C PAL standard
Power source : DC 6 V
Power consumption : 8 W
Signal system : PAL type
Video recording system
- Luminance : FM recording
- Colour : Converted sub carrier direct recording conform to VHS standard

Cassette : VHS-C cassette
Tape speed : 23.39 mm/sec
Maximum recording time : 45 minutes (with EC-45 cassette)
Video
- Output : 1 Vp-p, 75 ohms, unbalanced (Via AV OUT connector)
- S/N ratio : More than 42 dB

Audio
- Output : -6 dBs, 1 kohms (Via AV OUT connector)
- Mic. input : -68 dBs, high impedance, unbalanced

Pick up : 1/3" format CCD
Minimum required illumination : 5 lux (at F 1.4)
Illumination range : 5 to 100.000 lux
Lens : F 1.4, f=7 to 42 mm, 6:1 power zoom lens with auto iris and macro control, Filter diameter 46 mm (with set-up ring)
Viewfinder : Electronic viewfinder with 0.6" black/white CRT
Selectable high speed shutter : Switchable (1/50, 1/60, 1/125, 1/250, 1/500, 1/1000, 1/4000 second)
White balance adjustment: Full auto
Operating temperature : 0°C to 40°C
Operating humidity : 35 % to 80 %
Storage temperature : -20°C to 50°C
Dimensions : 162(W) x 116(H) x 121(D) mm (incl. viewfinder)
Weight : 760 g (without lens cap, pad, and thumb rest)

*** Design and specifications are subject to change without notice.**

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Important Safety Precautions

Prior to shipment from the factory, our products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

ADVARSEL!

LITHIUMBATTERIER. EKSPLOSIONSFARE.
UDKSIFTNING MÅ KUN FORETAGES AF SAGKYNDIG
OG SOM BESKREVET I SERVICEMANUALEN

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

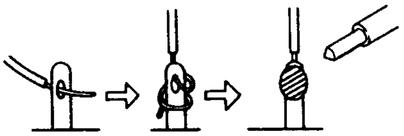


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

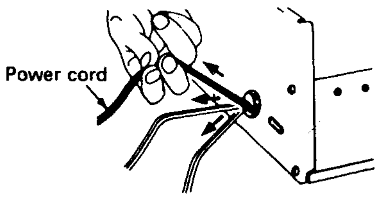


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

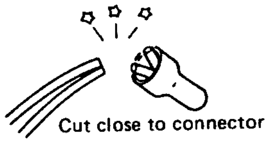


Fig. 3

       (2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

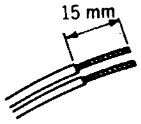


Fig. 4

       (3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

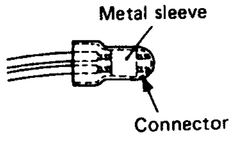


Fig. 5

       (4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

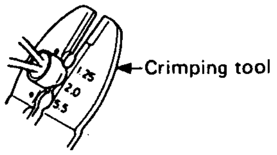


Fig. 6

       (5) Check the four points noted in Fig. 7.

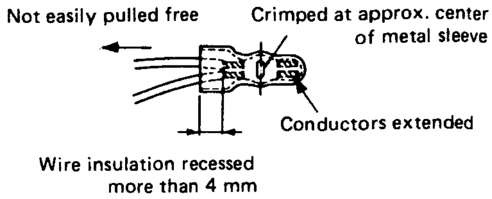

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

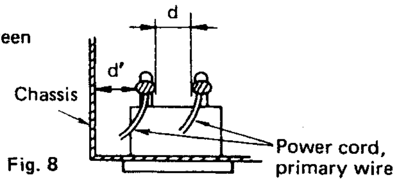


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   Measuring Method: (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

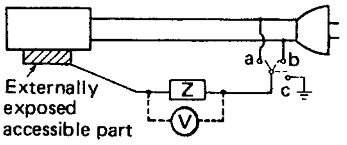


Fig. 9

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   Measuring Method:
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

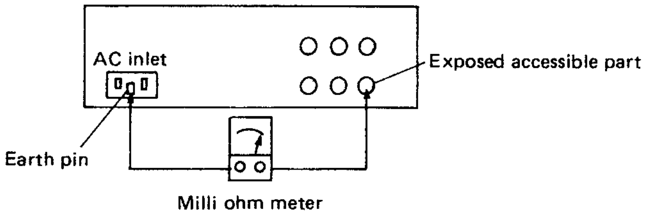


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

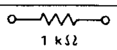
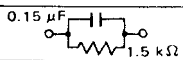
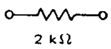
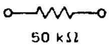
AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan		i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada		i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia		i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
			i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION 1
SERVICE CAUTIONS & DISASSEMBLY

1.1 PRECAUTIONS

1. Disconnect unit from power before removing or soldering components.
2. When removing a fastener (screw, washer, etc.), be careful not to drop it into the mechanism. If a fastener should be dropped, be sure to retrieve it before operation.
3. When removing a connector, pay special attention to flexible wires and wiring so as not to damage them.
4. Some resistors, shorting jumpers (0 ohm resistance), ceramic capacitors and diodes are chip parts. These chip parts cannot be reused after they are once removed. Refer to Section 1.3.
5. Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perfrom these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available. Especially, when the VR of the camera portion is adjusted, all VRs may require adjustment.
6. When removing and replacing parts, be careful not to damage or displace other parts. (Be especially careful with the video head assy and the tape transport mechanism.)
7. Pay special attention to the CCD image sensor and optical filter so that they won't be dusty, soiled or damaged. If it is soiled with fingerprints, etc., clean gently with silicon lens tissue or chamois.
8. When removing and replacing ICs, be careful not to damage circuit patterns.

1.2 REQUIRED TEST EQUIPMENT, FIXTURES/TOOLS AND OTHERS

For proper measurement and adjustment, make sure to use the following test equipment, fixtures/tools, in addition to general hand tools.

1.2.1 Test equipment, etc.

1. Color TV monitor
2. AC power adapter (SBC5423 or equivalent)
3. Oscilloscope (dual-trace type, for more than 20 MHz)
4. Frequency counter
5. Audio level meter and audio signal generator
6. Video signal generator
7. Sweep generator
8. Vectorscope
9. Halogen lamps

- **Color bar signal**

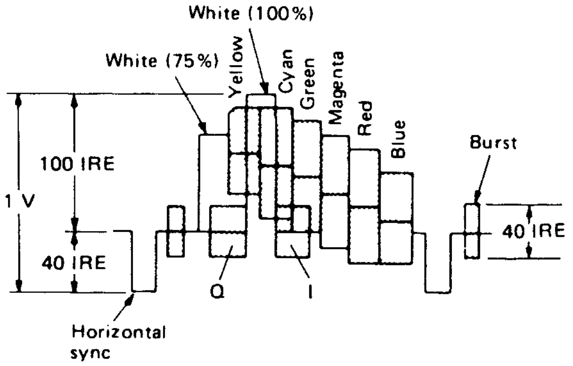


Fig. 1-2-1 Color bar signal waveform

- **Color bar pattern**

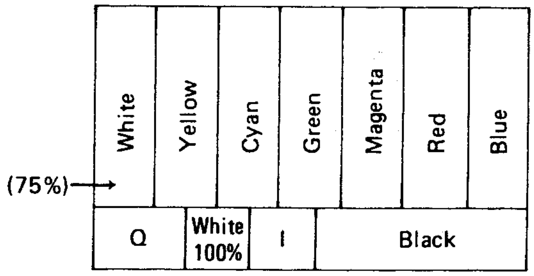


Fig. 1-2-2 Color bar pattern

- **Color sweep signal**

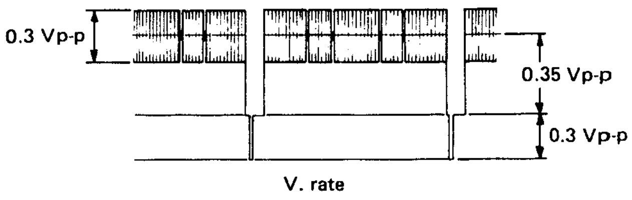


Fig. 1-2-3 Color sweep signal

1.2.2 Special test equipment and tools required for adjustment

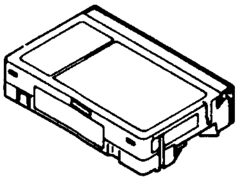
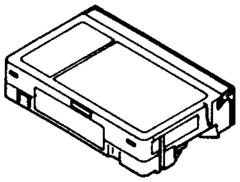
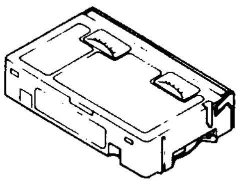
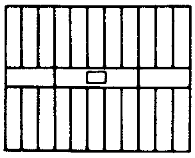
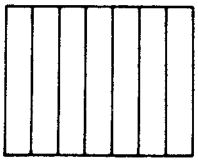
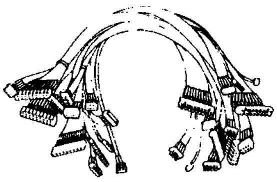
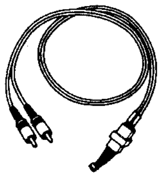
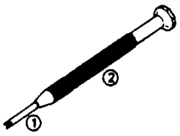
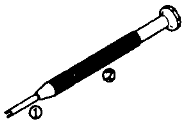
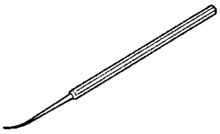
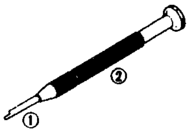
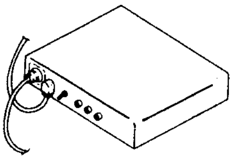
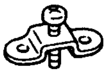
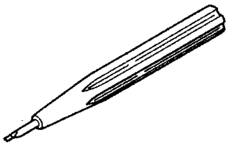
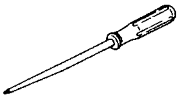
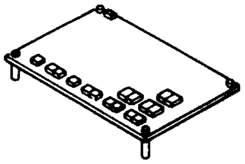
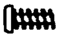
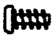
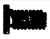
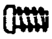
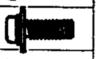
Alignment tape for SP interchangeability 4822 397 30141		Alignment tape for N. SP PB Y/C level 4822 397 30141	Cassette torque meter 4822 397 30153
			
Gray scale pattern 4822 397 10045 Reflection type, 11 steps, $\gamma = 2.2$	Color bar pattern 4822 397 10046 Reflection type, 7 colors	Patch cord set 4822 321 61177	Y/C separator cable 4822 395 90578
			
Chip parts replacing tool 4822 395 50262(incl. 1 & 2)	Chip parts replacing tool 4822 395 50261(incl. ① & ②)	Chip IC replacing tool	A/C head positioning tool 4822 395 50259(incl. ① & ②)
			
Y/C separator 4822 397 60098	Upper drum removal tool 4822 395 90902	Ultramini VR adjusting driver 4822 395 50419	0.35 mm adjusting driver 4822 395 50421
			
E. VR adjuster 4822 395 90901			
			

Table 1-2-1

1.2.3 Main screws to deal with disassembly/assembly

Table 1-2-2 lists screws by their symbols which correspond to those shown in figures of this section "Service Cautions & Disassembly".

Symbol of Screw	Shape
Ⓐ	
Ⓑ	
Ⓒ	
Ⓓ	
Ⓔ	

Symbol of Screw	Shape
Ⓕ	
Ⓖ	
Ⓗ	
Ⓘ	
Ⓙ	

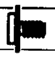
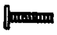
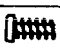
Symbol of Screw	Shape
Ⓚ	
Ⓛ	
Ⓝ	
Ⓞ	
Ⓟ	

Table 1-2-2

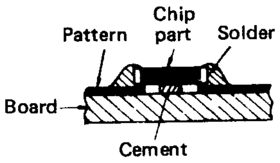
1.3 REPLACEMENT OF CHIP PARTS

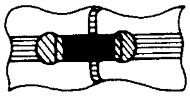
For replacing chip parts, proceed as follows.
Use a well-insulated fine-tipped soldering iron (approx. 17 W, 130°C ~ 260°C in temperature).
In addition, it is recommended to use a soldering iron with solder absorber (55 W approx.) for convenience.

Caution:
- *Do not apply heat for more than 3 seconds.*
- *Do not rub electrodes.*
- *Do not reuse chip parts once they are removed.*
- *Supplementary cementing is not required.*

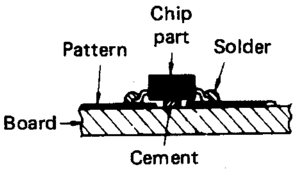
1.3.1 Soldered condition of chip parts

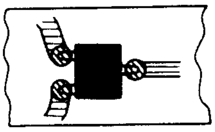
- Resistors, capacitors, etc.





- Transistors, diodes, etc.

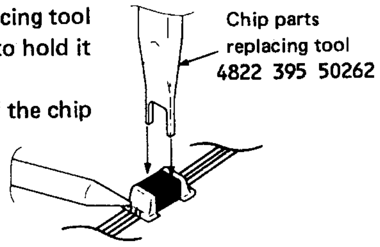




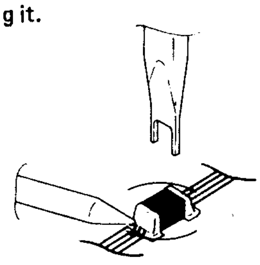
1.3.2 How to remove chip parts

- Resistors, capacitors, etc.

1. Set a chip parts replacing tool onto the chip parts to hold it down.
2. Unsolder at a side of the chip parts.

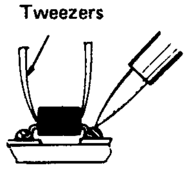


3. Remove the chip part by twisting and sliding it.

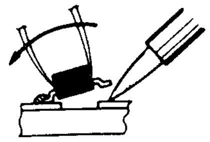


- Transistors, diodes, etc.

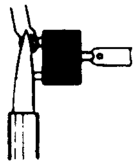
1. Unsolder at the one-lead side of the chip parts.



2. Lift the unsoldered side upward.



3. Heat the other two leads simultaneously and remove the chip parts upward.

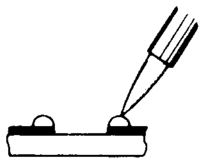


1.3.3 Preheating and soldering chip parts

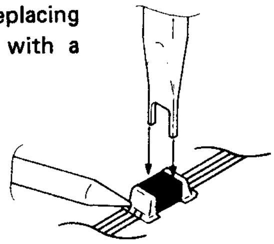
Just before soldering new chip parts except transistors, but capacitors including, preheat them with hot air (150°C approx.) by use of a blower type of hair dryer for about 2 minutes. Immediately after that, solder it with a soldering iron of 30 W approx.

1.3.4 How to set and solder chip parts

1. Presolder the contact points of the circuit pattern to which the chip parts will be soldered.



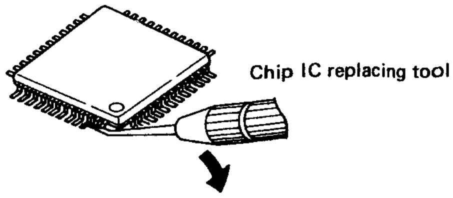
2. Hold down the chip parts with the chip parts replacing tool, then, solder it with a soldering iron.



1.4 REMOVING OF FLAT ICs

(Recommended method)

1. For removing solder chips from IC's pins, use a solder remover or a braided solder absorber.
2. Heat the IC's tips evenly by moving the chip IC replacing tool around them, and carefully separate the IC's leads with the tool as illustrated.
3. Do not reuse ICs that have been removed. (Discard them.)



1.5 DISASSEMBLY OF CAMERA SECTION

Note: *Three kinds of double-arrows in connection tables respectively show kinds of connectors/wires.*

♦ : Board-to-Board connector
⇔ : Flat wire
↔ : Wire

1.5.1 Operation unit

1. Remove four screws Ⓐ, and lift the operation unit in the direction of the arrow to remove it after disconnecting the connector ①.

Con-nector	No.of pins	Connection
①	12	OPERATION(DECK) CN1 ♦ 01 VTR CN5

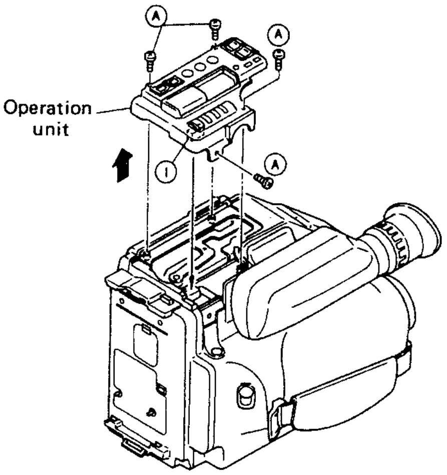


Fig. 1-5-1 Operation unit

1.5.2 Electronic viewfinder

1. Remove two screws Ⓑ and disconnect the connector ①.

Con-nector	No.of pins	Connection
①	5	Electronic viewfinder ↔ 01 VTR CN12

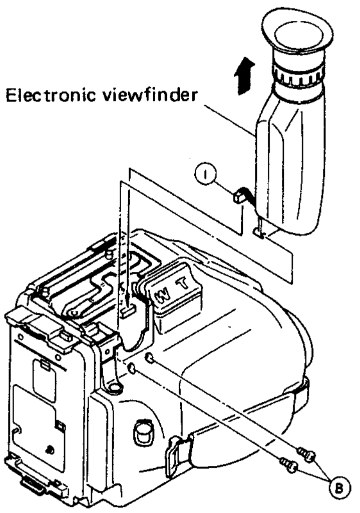


Fig. 1-5-2 Electronic viewfinder

1.5.3 Front panel assembly

1. Remove three screws Ⓒ and a screw Ⓑ .
2. Slide the hood assembly in the direction of the arrow ⓐ and remove it in the direction of the arrow ⓑ.
3. Move the front panel assembly in the direction of the arrow ⓒ and disconnect the connectors ① and ②.

Con-nector	No.of pins	Connection
①	2	16 TALLY CN1 ↔ 17 JUNCTION CN1
②	2	Microphone unit ↔ 02 JACK CN3

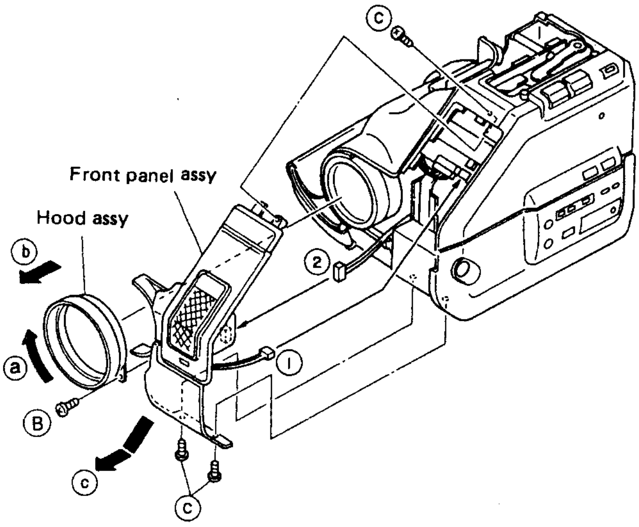


Fig. 1-5-3 Front panel assembly

4. Remove a screw Ⓟ and the white balance sensor and detach the front panel assembly completely.
To detach the microphone unit, release it from locking by three pawls and move it in the direction of the arrow.

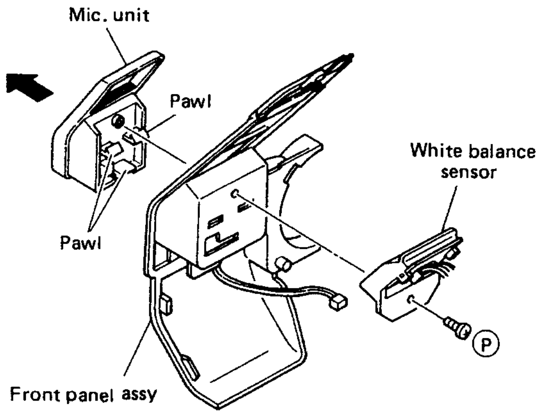


Fig. 1-5-4 White balance sensor & microphone unit

1.5.4 Cassette cover assembly

1. Remove two screws Ⓓ and slide cassette cover assembly in the direction of the arrows.
2. Disconnect the connector ① and take off the cassette cover assembly.

Con-nector	No.of pins	Connection
①	7	OPERATION (CAMERA) ⇔ $\boxed{1}\boxed{7}$ JUNCTION CN3

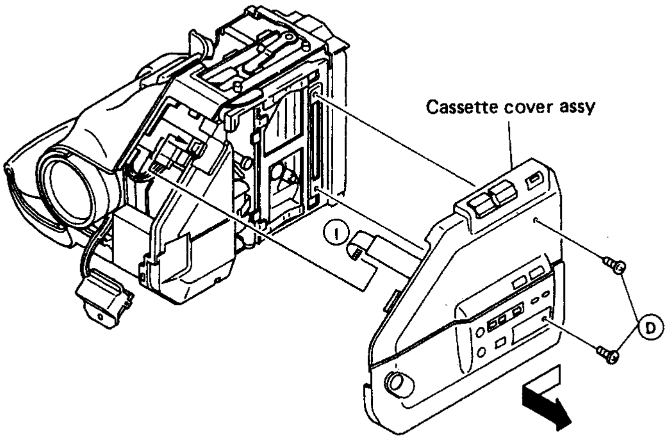


Fig. 1-5-5 Cassette cover assembly

1.5.5 Upper cover assembly

1. Remove two screws Ⓒ and disconnect the connector ①.

Con-nector	No.of pins	Connection
①	9	$\boxed{1}\boxed{7}$ JUNCTION CN2 ↔ $\boxed{1}\boxed{1}$ CAM CPU CN16, $\boxed{1}\boxed{5}$ AF CN59

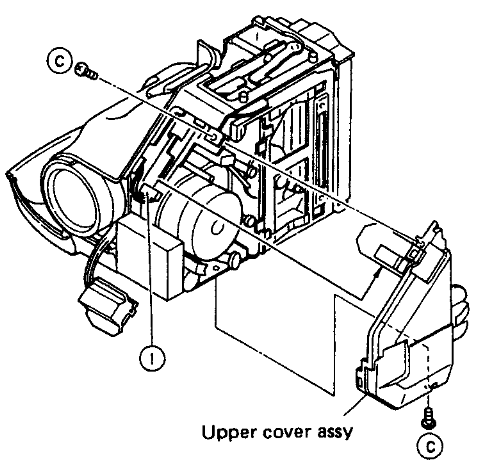


Fig. 1-5-6 Upper cover assembly

1.5.6 Rear cover assembly

1. Remove four screws Ⓑ and disconnect the connector ①.

Con-nector	No.of pins	Connection
①	8	$\boxed{1}\boxed{8}$ DISPLAY CN1 ↔ $\boxed{0}\boxed{1}$ VTR CN1, $\boxed{1}\boxed{1}$ CPU CN16

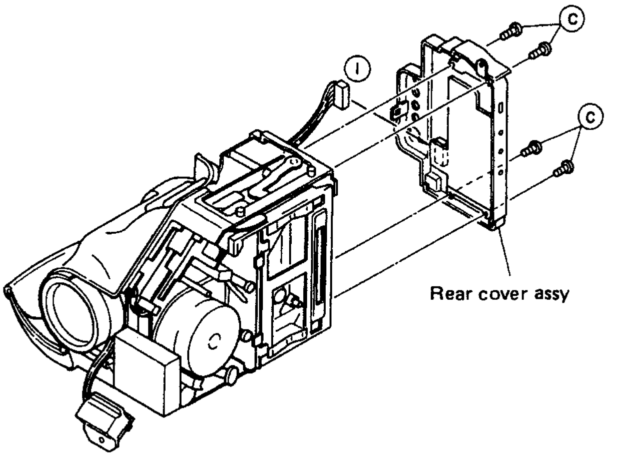


Fig. 1-5-7 Rear cover assembly

1.5.7 Lower case assembly

1. Remvove three screws Ⓒ, and two screws Ⓔ. Then, move the main body unit in the direction of the arrow and disconnect the connectors ① and ②.

Con-nector	No.of pins	Connection
①	3	$\boxed{1}\boxed{5}$ AF CN55 ↔ ZOOM switch
②	3	$\boxed{0}\boxed{1}$ VTR CN17 ↔ $\boxed{0}\boxed{5}$ TRIGGER CN1

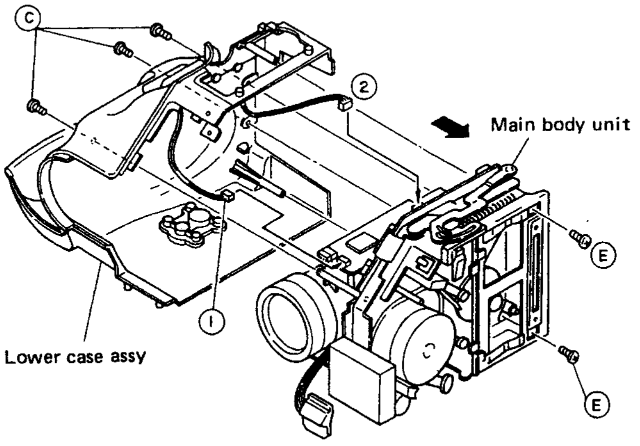


Fig. 1-5-8 Lower case assembly

1.5.8 Camera section

1. Remove a screw Ⓔ.
2. Move the camera section in the direction of the arrow, and disconnect the connectors ① and ②.
3. Disconnect the connectors ③, ④ and ⑤.

Con-nector	No.of pins	Connection
①	16	01 VTR CN14 ⬌ 11 CPU CN11
②	10	01 VTR CN15 ⬌ 12 VIDEO CN21
③	9	11 CPU CN16 ↔ 17 JUNCTION CN2 18 DISPLAY CN1
④	4	15 AF CN59 ↔ 17 JUNCTION CN2
⑤	7	11 CPU CN15 ↔ Auto white sensor

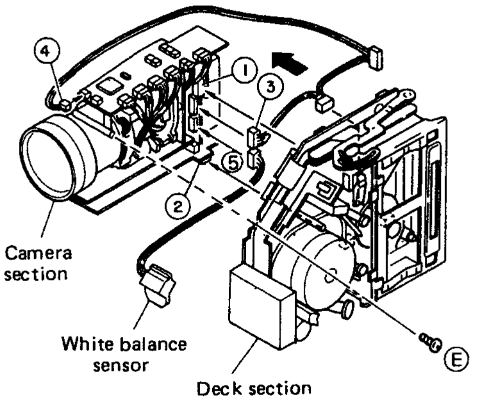

④
①
③
⑤
②
Camera section
White balance sensor
Deck section
Ⓔ

Fig. 1-5-9 Camera section

1.5.9 Hookup for inspection and adjustment of camera section

After detaching the camera section and deck section from each other, connect the following patch cords as shown in Fig. 1-5-10 for the purpose of inspection and adjustment of the camera section.

Con-nector	No.of pins	Label No.	Connection
①	8	PPU58655A-8	18 DISPLAY CN1 ↔ 01 VTR CN1
②	9	PPU58655A-9	17 JUNCTION CN2 ↔ 11 CPU CN16
③	12	YUJ41361B-12	OPERATION (DECK) CN1 ⬌ 01 VTR CN5
④	10	YUJ41361B-10	12 VIDEO CN21 ⬌ 01 VTR CN15
⑤	7	YUJ40095A-7	11 CPU CN15 ↔ Auto white sensor
⑥	16	YUJ41358B-16T	11 CPU CN11 ⬌ 01 VTR CN14 EVR ADJUSTER

Note: *For auto focus adjustment, refer to the connection shown in Fig. 3-4-1 (Section 3.4).*

Note: *Adjustments except "Auto White Balance adjustment (Sect. 3.3.2)" can be performed as the camera section and the deck section are combined.*

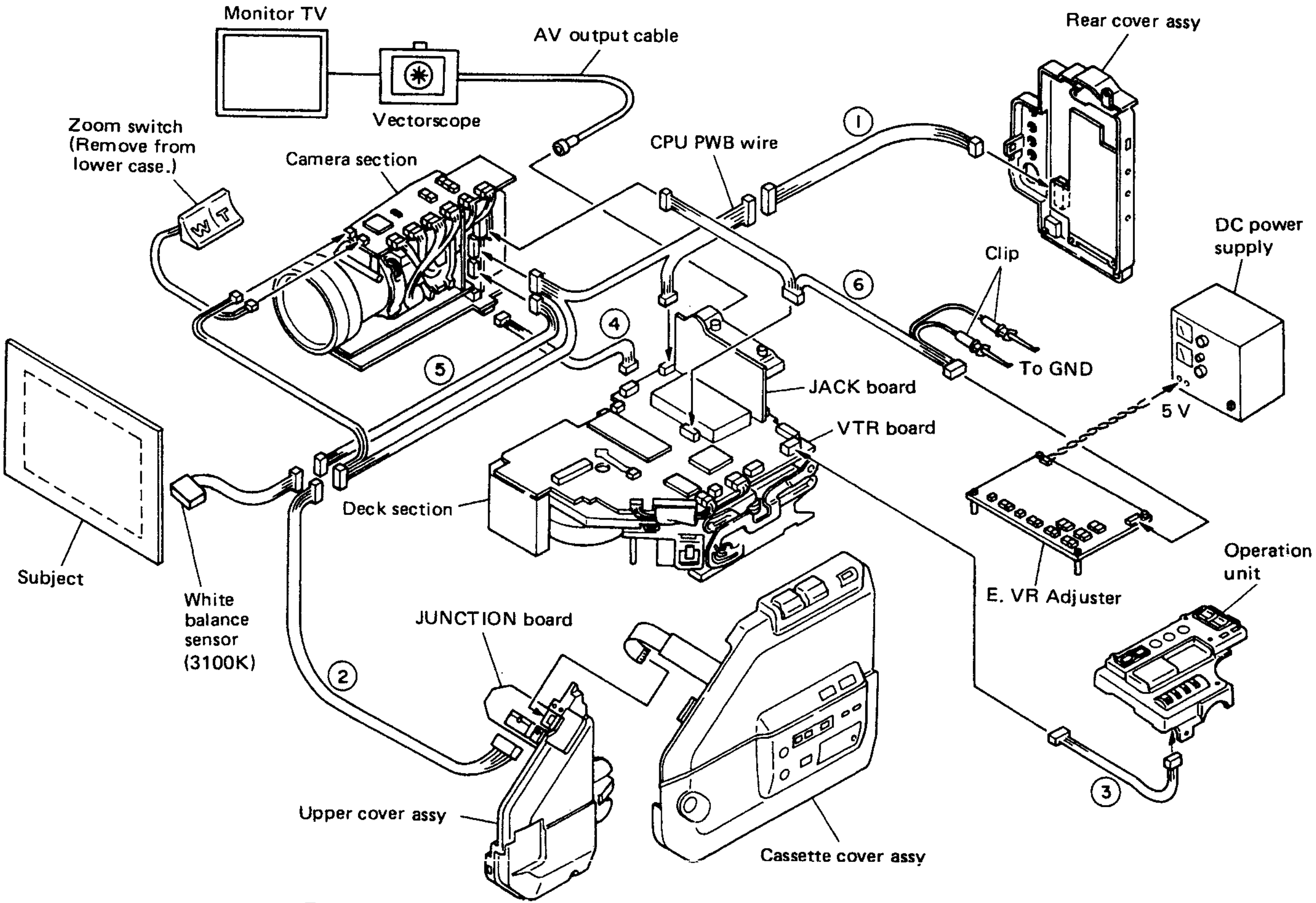

Monitor TV
AV output cable
Rear cover assy
Vectorscope
Zoom switch (Remove from lower case.)
W T
Camera section
CPU PWB wire
①
DC power supply
Clip
⑥
④
⑤
To GND
JACK board
5 V
VTR board
Deck section
Subject
White balance sensor (3100K)
E. VR Adjuster
Operation unit
JUNCTION board
②
③
Upper cover assy
Cassette cover assy

Fig. 1-5-10 Setup for inspection and adjustment of camera section

For replacement of the CCD image sensor and the OP block as the next step of the adjustment procedure, remove the following boards.

Note: *Since the structure of all boards of the camera section is the board-to-board connector (1 mm pitch), carefully remove each board so as not to damage it.*

1.5.10 VIDEO board

1. Move the VIDEO board in the direction of the arrow and disconnect the connectors ①, ② and ③.

Con-nector	No.of pins	Connection
①	8	[1][2] VIDEO CN23 ↔ DC-DC converter
②	30	[1][2] VIDEO CN22 ↔ [1][1] CPU CN12
③	30	[1][2] VIDEO CN24 ↔ [1][3] SSG CN32

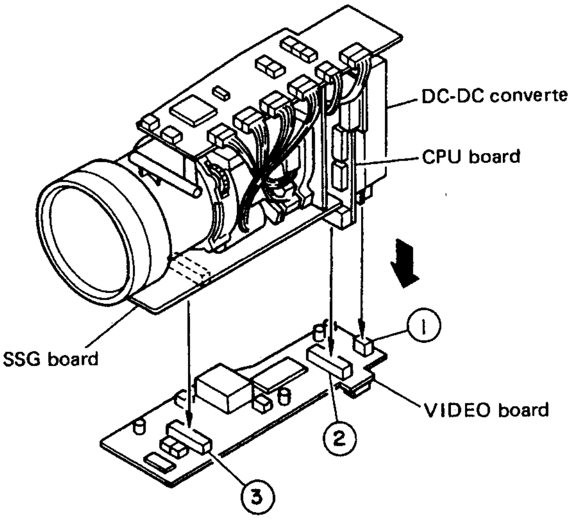


Fig. 1-5-11 VIDEO board

1.5.11 DC-DC converter

1. Move the DC-DC converter in the direction of the arrow and disconnect the connector ①.

Con-nector	No.of pins	Connection
①	6	DC-DC converter CN61 ↔ [1][5] AF CN52

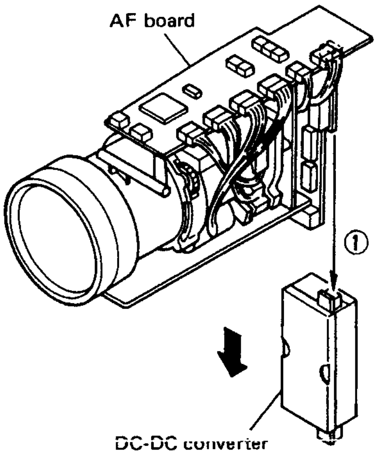


Fig. 1-5-12 DC-DC converter

1.5.12 SSG board

1. Remove a screw Ⓔ.
2. Move the CPU board in the direction of the arrow ⓐ, and disconnect the connector ①.
3. Move the SSG board in the direction of the arrow ⓑ, and disconnect the connector ②.

Con-nector	No.of pins	Connection
①	14	[1][3] SSG CN31 ↔ [1][1] CPU CN13
②	16	[1][3] SSG CN33 ↔ [1][4] CCD CN41

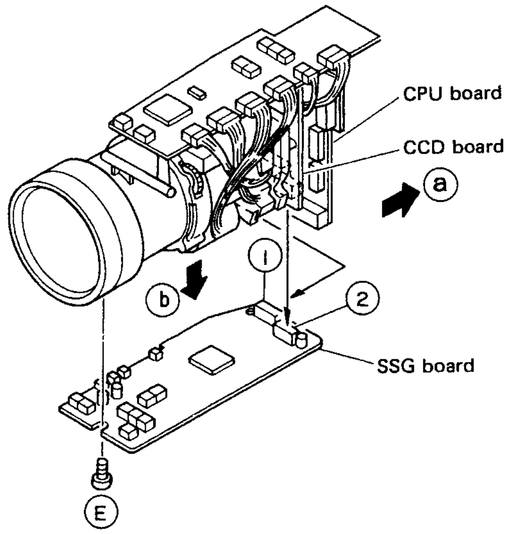


Fig. 1-5-13 SSG board

1.5.13 AF board

1. Remove two screws Ⓔ.
2. Disconnect the connectors ① to ⑥.

Connector	No.of pins	Connection
①	3(W)	$\boxed{1}\boxed{5}$ AF CN57 ↔ Zoom encoder
②	4(Y)	$\boxed{1}\boxed{5}$ AF CN58 ↔ Infinite sensor
③	4(W)	$\boxed{1}\boxed{5}$ AF CN60 ↔ Iris motor
④	4(R)	$\boxed{1}\boxed{5}$ AF CN53 ↔ Hall element
⑤	2(W)	$\boxed{1}\boxed{5}$ AF CN56 ↔ Zoom motor
⑥	4(B)	$\boxed{1}\boxed{5}$ AF CN54 ↔ AF motor

W : White Y : Yellow R : Red B : Black

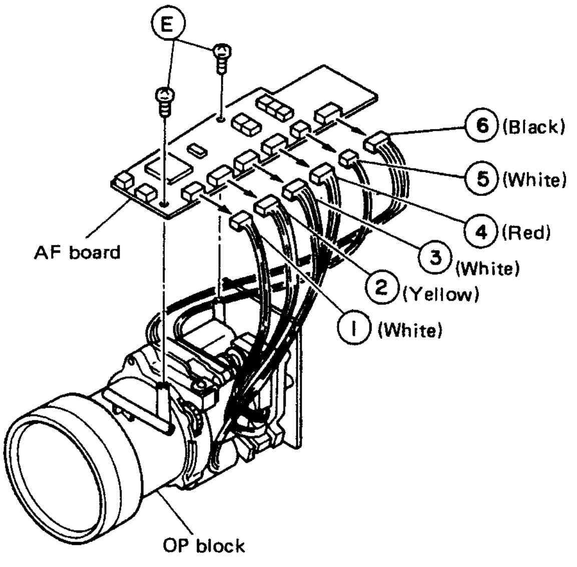


Fig. 1-5-14 AF board

1.5.14 CCD board

1. Remove two screws Ⓕ.
2. Move the CCD board in the direction of the arrow. At that time, pay careful attention to pins of the CCD image sensor sc as not to damage them.

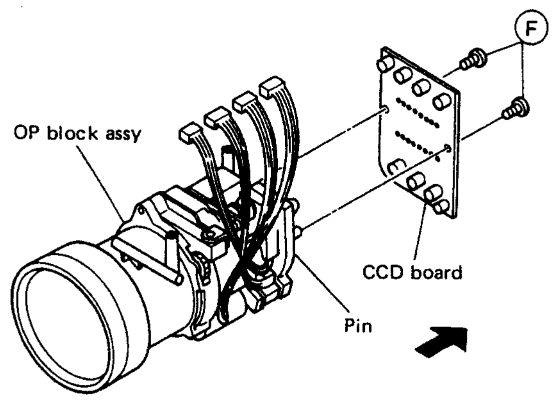


Fig. 1-5-15 CCD board

1.5.15 Replacement of CCD image sensor

Note:

- *Pay the most careful attention to the transparent glass and optical filters of the CCD image sensor so as not to soil and damage them. If something is soiled with fingerprints, etc., gently clean it with silicone-processed paper/cloth or chamois.*
- *When the CCD image sensor is shipped from the factory, there are protection seals applied onto the transparent glass. Leave the protector as it is, and take it off just before assembling the CCD image sensor to the OP block.*

- **Removal of CCD image sensor**

1. Remove two screws Ⓖ securing the imager holder.
2. Remove two screws Ⓗ securing the filter holder, and disassemble the optical filter, spacer rubber, and CCD image sensor from the holder.

- **Installation of new CCD image sensor**

1. Remove the protection seal from a new CCD image sensor and set it on the imager holder. Next, put the spacer rubber, optical filter, filter holder on the CCD image sensor as they are piled up in this order. At that time, make sure of orientation of each item referring to the following table (see Fig. 1-5-16).

Parts Name	Orientation
Imager holder	Label No. is upside-down viewed as indicated by the arrow ⓐ.
CCD image sensor	Mark is on the right viewed as indicated by the arrow ⓐ.
Spacer rubber	IC side is horizontal.
Optical filter	Marking orientates toward downside of OP block.

2. Next, fix the filter holder to the imager holder with the two screws Ⓗ.
3. Fix the imager holder to the OP block with the two screws Ⓖ. At that time, be careful of the orientation.
4. After completion of the CCD image sensor replacement and reassembly of all P.C. boards to the camera section, observe the monitor to confirm no vignetting caused by the bodytube, rings, lens hood, etc. If no vignetting is observed, it can be said that image's parallel, horizontality and centering are correct.
5. After all of the above steps, perform the Auto Focus Adjustment described in Section 3.4.

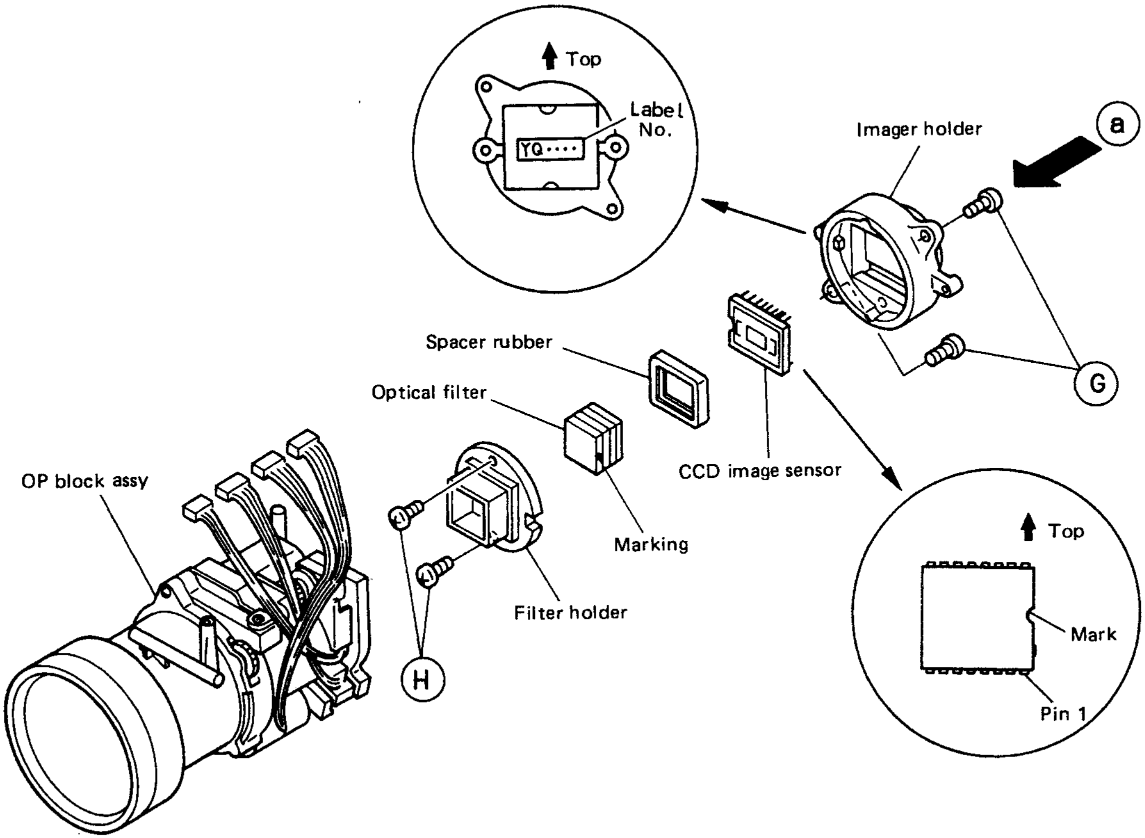

Top
Label No.
YQ····
Imager holder
a
G
Spacer rubber
Optical filter
OP block assy
CCD image sensor
Marking
Filter holder
H
Top
Mark
Pin 1

Fig. 1-5-16 CCD image sensor

1.5.16 OP (optical) block assembly

After removal of the imager holder (Section 1.5.15), replace the OP block assembly.

- **Zoom motor assembly**

1. Remove two screws Ⓘ.

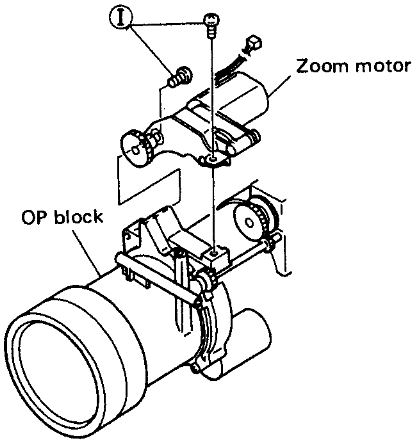

Ⓘ
Zoom motor
OP block

Fig. 1-5-17 Zoom motor assembly

Note: ***After the OP block assembly and the zoom motor assembly are replaced, perform the Auto Focus Adjustment of Section 3.4.***

1.5.17 Electronic viewfinder

1. Match the markings and turn the lens assembly in the direction of the arrow ⓐ, then move it in the direction of the arrow ⓑ to detach it.
2. Remove three screws Ⓝ, two screws Ⓞ and the O-ring.

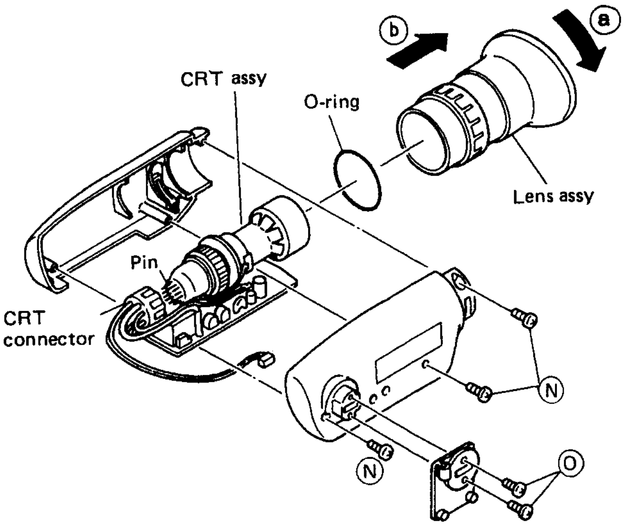

ⓑ
ⓐ
CRT assy
O-ring
Lens assy
Pin
CRT connector
Ⓝ
Ⓝ
Ⓞ

Fig. 1-5-18 Electronic viewfinder

3. When replacing the CRT, securely and carefully connect withe the CRT connector being careful not to bend or damage pins of the CRT.

1.6 DISASSEMBLY OF DECK SECTION

Note: *Three kinds of double-arrows in connection tables respectively indicate kinds of connectors/wires.*

⬌ : Board-to-Board connector
⇔ : Flat wire
↔ : Wire

1.6.1 Hookup for inspection and adjustment of deck section

After detaching the camera section and deck section from each other according to Section 1.5.8, connect the following patch cords as shown in Fig. 1-6-1 for the purpose of inspection and adjustment of the deck section.

Connector	No.of pins	Label No.	Connection
①	8	PPU58655A-8	$\boxed{1}\boxed{8}$ DISPLAY CN1 ↔ $\boxed{0}\boxed{1}$ VTR CN1
②	12	YUJ41361B-12	OPERATION (DECK) CN1 ⬌ $\boxed{0}\boxed{1}$ VTR CN5
③	4↔10	YUJ41358B-10T	Y/C separator cable ⬌ $\boxed{0}\boxed{1}$ VTR CN15
④	3	YUJ40095A-3	$\boxed{0}\boxed{1}$ VTR CN17 ↔ $\boxed{0}\boxed{5}$ TRIGGER CN1

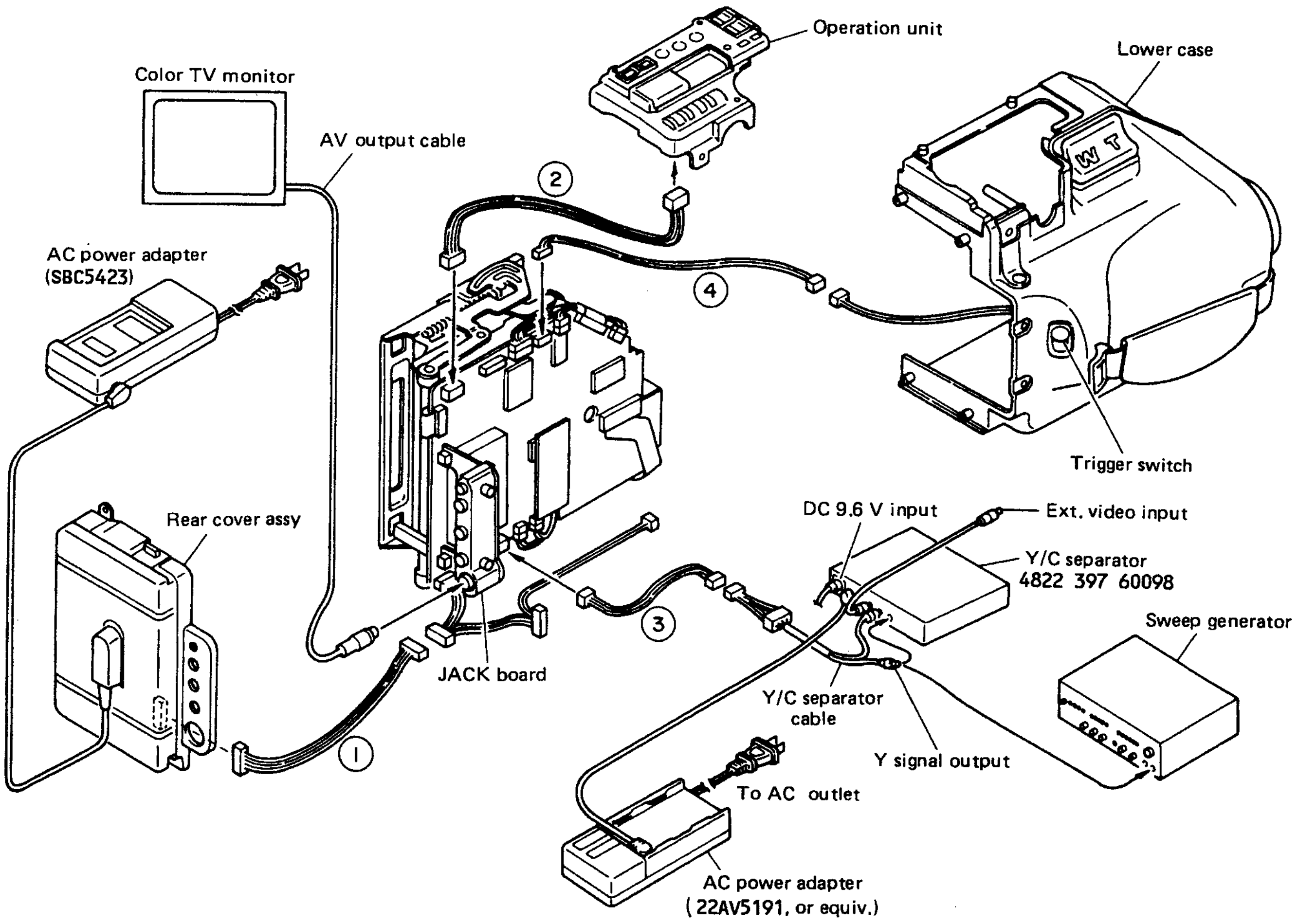

Operation unit
Lower case
Color TV monitor
AV output cable
②
AC power adapter
(SBC5423)
④
Trigger switch
Rear cover assy
DC 9.6 V input
Ext. video input
Y/C separator
4822 397 60098
Sweep generator
③
JACK board
Y/C separator cable
①
Y signal output
To AC outlet
AC power adapter
(22AV5191, or equiv.)

Fig. 1-6-1 Hookup for inspection and adjustment of deck section

For inspection and adjustment of phase of the mechanism, remove P.C. boards from the deck section.

1.6.2 JACK board

1. Move the JACK board in the direction of the arrow, and disconnect the connectors ① and ②.

Con-nector	No.of pins	Connection
①	6	01 VTR CN2 ⬌ 02 JACK CN1
②	6	01 VTR CN19 ⬌ 02 JACK CN2

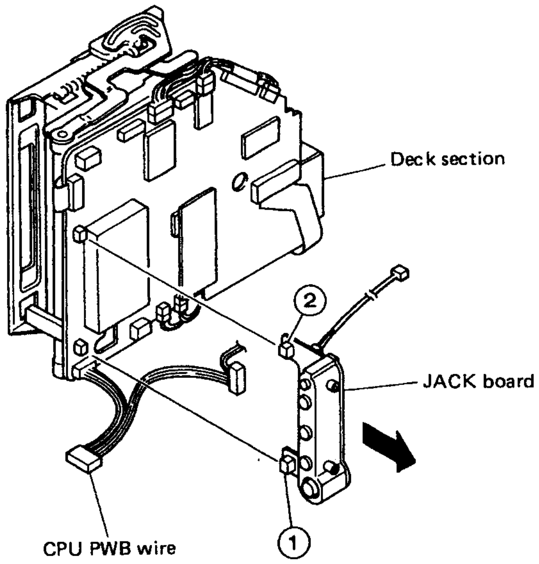


Fig. 1-6-2 JACK board

1.6.3 VTR board

1. Remove a screw Ⓙ and a screw Ⓚ.
2. Disconnect connectors ①, ②, ③, ④, ⑤ and ⑥. Then, the VTR board can be opened.
3. Disconnect connectors ⑦, ⑧, ⑨ and ⑩. Then, the VTR board can completely be detached.

Con-nector	No.of pins	Connection
①	2	01 VTR CN18 ↔ End sensor
②	2	01 VTR CN9 ↔ Mode controi motor
③	15	01 VTR CN8 ⇔ Drum motor
④	7	01 VTR CN4 ⇔ 04 SENSOR
⑤	3	01 VTR CN13 ⬌ Flying erase head
⑥	14	01 VTR CN10 ⬌ 03 PRE REC CN1
⑦	4	01 VTR CN6 ↔ Control head
⑧	15	01 VTR CN7 ⇔ Capstan motor
⑨	2	01 VTR CN16 ↔ Dew sensor
⑩	5	01 VTR CN3 ↔ Audio head

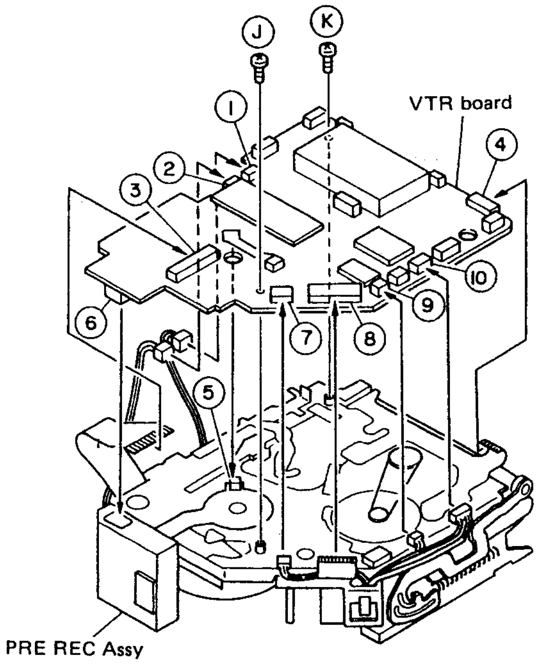


Fig. 1-6-3 VTR board

1.6.4 PRE REC ASSY

1. Draw the CONNECTOR board out in the direction of the arrow (see Fig. 1-6-4).
   At that time, pay attention to 10 pins of the drum terminal so as not to bend and damage them.
2. Remove a screw Ⓛ and detach the PRE REC Assy from the deck section.

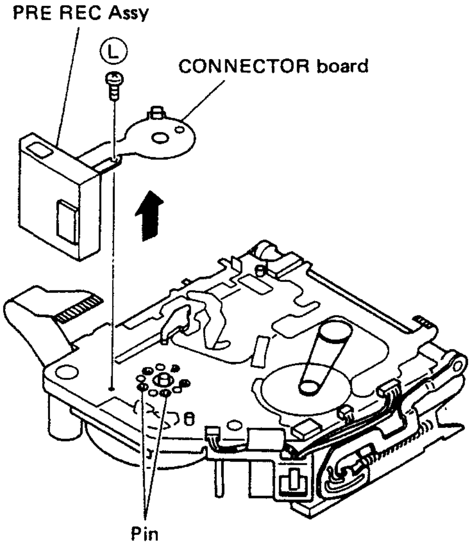


Fig. 1-6-4 PRE REC Assy

1.6.5 SENSOR board

1. Remove three screws Ⓙ and disconnect the connector ①.

Connector	No.of pins	Connection
①	3	[0][4] SENSOR CN1 ⬌ Camera switch

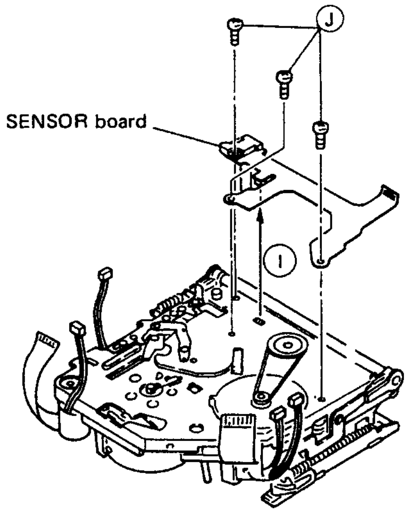


Fig. 1-6-5 SENSOR board

1.6.6 Replacement of cassette housing

1. After detaching the deck section from the camera section in the procedure of Section 1.5.8, move the lock plate in the direction of the arrow ⓐ to set the cassette housing to the Eject mode.

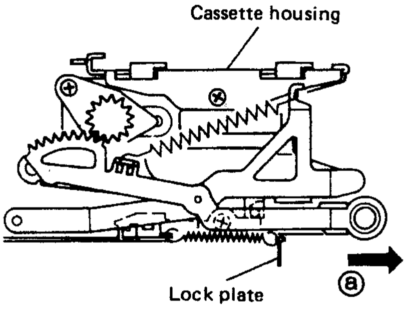


Fig. 1-6-6A Cassette housing - 1

2. Remove two screws Ⓙ.
3. Open both arms of the cassette housing in the directions of the arrow ⓑ to make them come out of the guide rail of the main deck.
4. Remove the cassette housing in the direction of the arrow ⓒ.

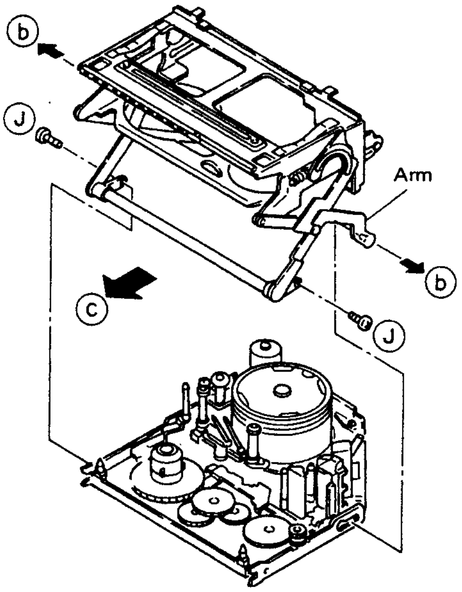


Fig. 1-6-6B Cassette housing - 2

1.6.7 To take out cassette tape

When the deck enters the Emergency mode with a cassette tape loaded and it cannot be ejected by pressing the EJECT button, take the cassette tape out of the cassette housing according to the following procedure.

1. Disconnect the deck from the power source and remove the operation unit, front panel assembly, cassette cover assembly and upper cover assembly according to the descriptions of Sections 1.5.1, 1.5.3, 1.5.4 and 1.5.5 of "Disassembly of Camera Section".
2. Remove wires of the mode control motor as shown in the magnified view Ⓐ (Fig. 1-6-7) and connect jumping wires to the terminals.
   Note: *This is for protection of the Mechacon CPU.*
3. Holding the cassette housing by hand, connect the jumping wires to a UM3 battery and set the mechanism for Unloading as it is in the Eject mode. In this condition, turn the take-up gear (see the magnified view Ⓑ) in the direction of the arrow ⓐ (toward the drum) to wind the tape. Checking up whether the tape is damaged or not, stop holding of the cassette housing by hand.
   Note: *If the mechanism comes into the unloading mode as the cassette tape is not held by hand, it results in tape damage.*

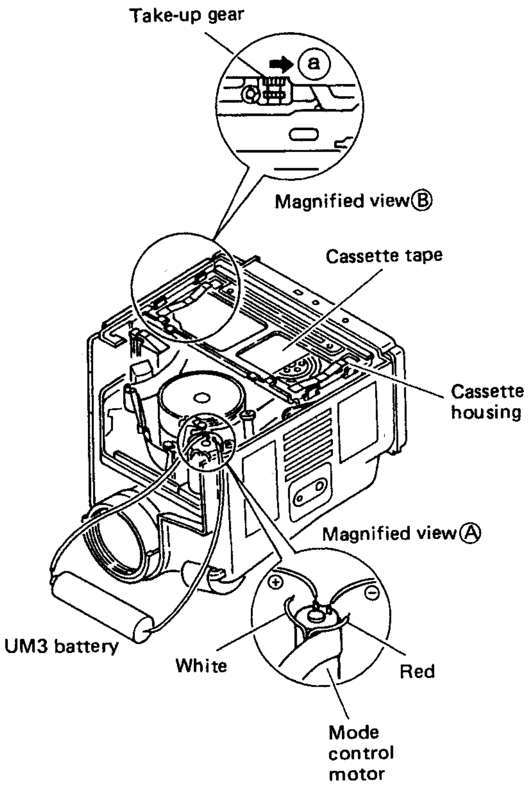

Take-up gear
ⓐ
Magnified viewⒷ
Cassette tape
Cassette housing
Magnified viewⒶ
⊕
⊖
UM3 battery
White
Red
Mode control motor

Fig. 1-6-7 To take out cassette tape

1.6.8 Replacement of upper drum

Note: *Be very careful not to touch any head of a new upper drum as well as not to damage the drum.*

- **Removal**

1. Carefully unsolder at 10 points shown in Fig. 1-6-8 on the UPPER DRUM board.
   Note: *If solder is not completely removed, it may cause damage of the head pins when the upper drum is removed.*

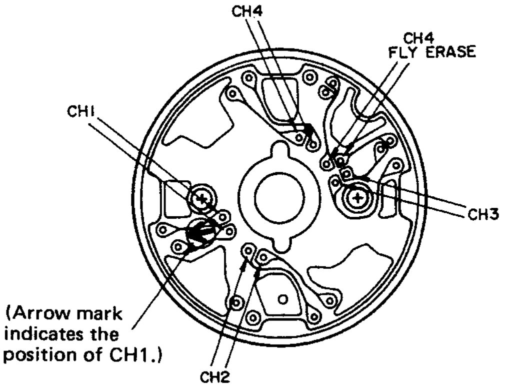

CH4
CH4
FLY ERASE
CH1
CH3
(Arrow mark indicates the position of CH1.)
CH2

Fig. 1-6-8 Upper drum replacement (1)

2. Remove two screws and draw out the upper drum in the direction of the arrows.

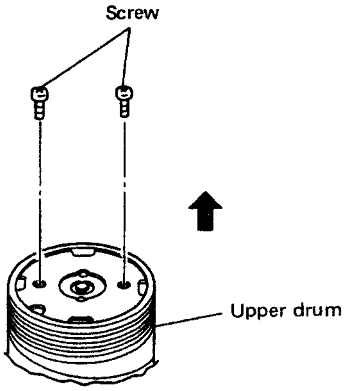

Screw
Upper drum

Fig. 1-6-9 Upper drum replacement (2)

3. When it is hard to remove the upper drum, set the upper drum removal tool 4822 395 90902 with the screws which are once removed in the step 2, and tighten the center screw to remove it easily.

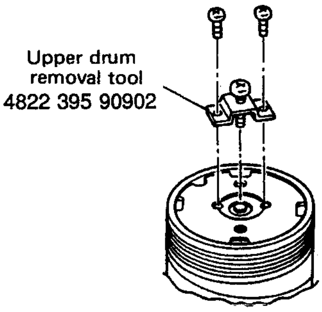

Upper drum removal tool
4822 395 90902

Fig. 1-6-10 Upper drum replacement (3)

- **Installation**

1. Before installing a new upper drum, insert a soldering iron (50 W) into the hole of the upper drum and heat it for about 3 to 5 minutes to expand it.

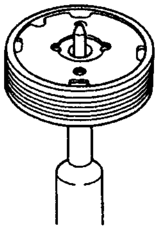


Fig. 1-6-11 Upper drum replacement (4)

2. Set the upper drum so that its hole A and the hole B of the lower drum are positioned oppositely (180°) in a line, and temporarily tighten the two screws.

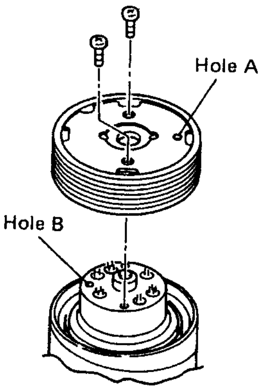

Hole A
Hole B

Fig. 1-6-12 Upper drum replacement (5)

3. Tighten the screws lightly first, then, alternately tighten them gradually as the upper drum is cooled.
4. After replacement finishes, make sure to check up and adjust the following items.
   - Servo and interchangeability
   - Luminance (Y) signal circuit
   - Color (C) signal

1.6.9 Checkup and adjustment of mechanism phase

Note: *Pay careful attention to the installing order and phase of mechanism parts of the loading system.*

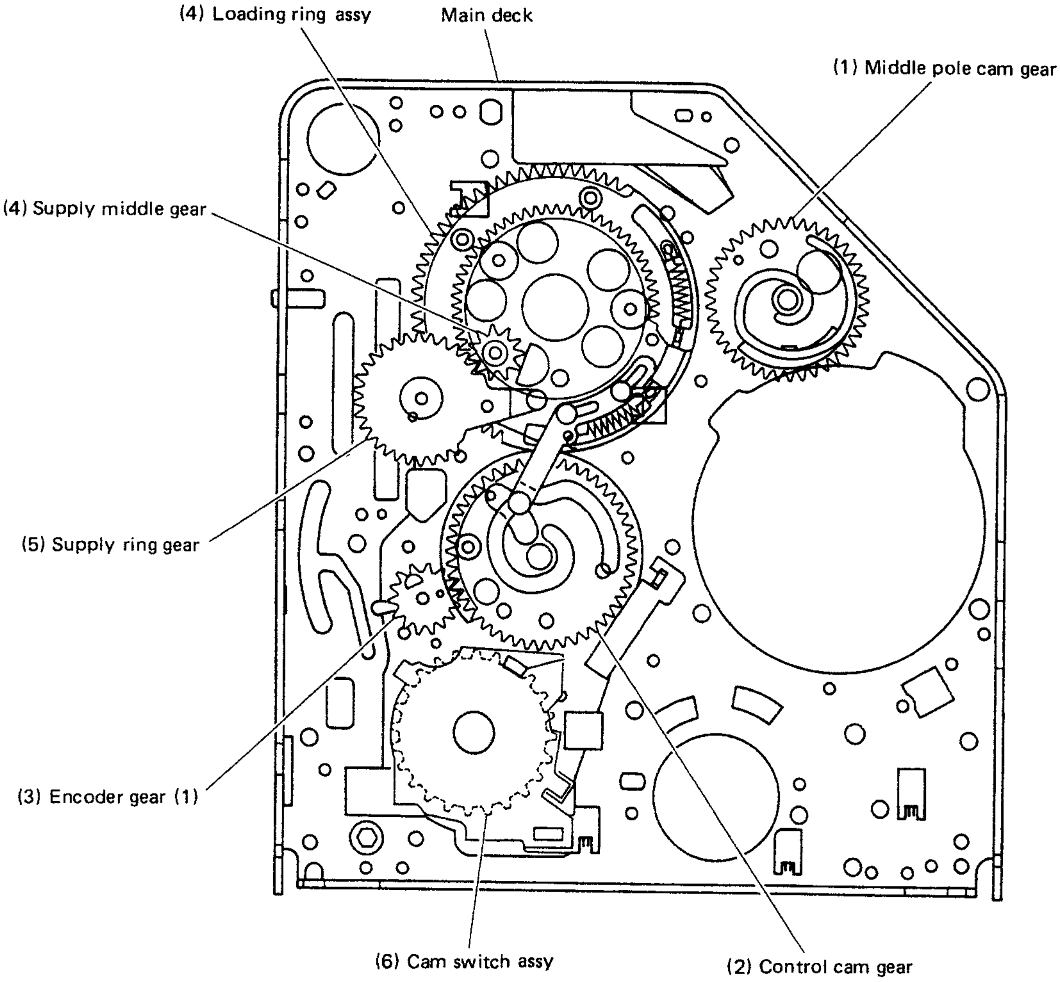

(4) Loading ring assy
Main deck
(1) Middle pole cam gear
(4) Supply middle gear
(5) Supply ring gear
(3) Encoder gear (1)
(6) Cam switch assy
(2) Control cam gear

Fig. 1-6-13 Phase adjustment of loading system

1. Middle pole cam geer
   Position the middle pole cam gear so that its adjusting hole and the hole of the main deck coincide with each other.

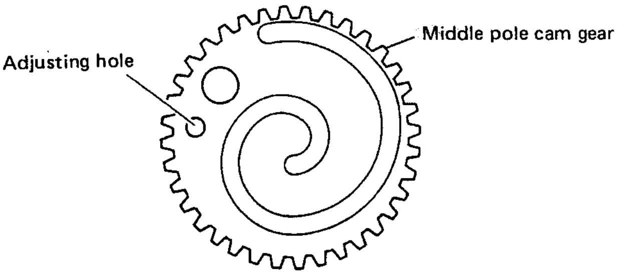

Adjusting hole
Middle pole cam gear

Fig. 1-6-14 Middle pole cam gear

2. Control cam gear
   Position the control cam gear so that its adjusting hole and the hole of the main deck coincide with each other. At that time, confirm that the holes of the link (located on the back of the main deck) and the hole of the main deck coincide with each other.

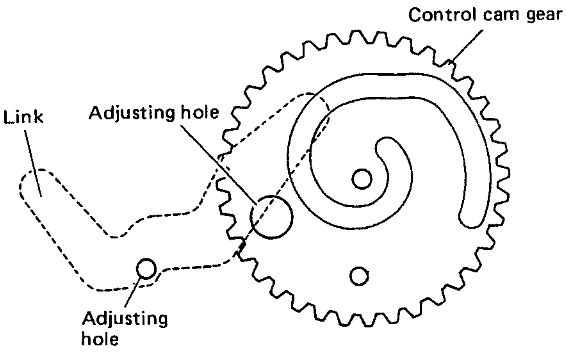

Control cam gear
Link
Adjusting hole
Adjusting hole

Fig. 1-6-15 Control cam gear

3. Encoder gear (1)
   Engage the encoder gear (1) with the control cam gear so that the marking of the encoder cam gear (1) is positioned in the line between the axes of the encoder gear (1) and the control cam gear.

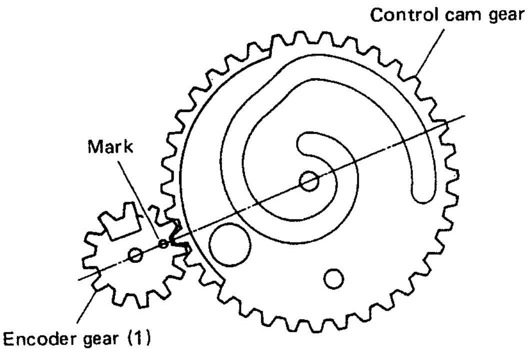

Control cam gear
Mark
Encoder gear (1)

Fig. 1-6-16 Encoder gear (1)

4. Loading ring assembly, supply middle gear
   Engage the supply middle gear with the loading ring assembly so that two teeth of the supply middle gear and the internal first two teeth of the loading ring assy are gearing with each other.

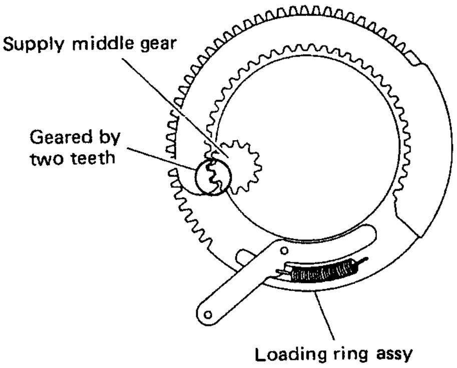

Supply middle gear
Geared by two teeth
Loading ring assy

Fig. 1-6-17 Loading ring assy, supply middle gear

5. Supply ring gear
   Engage the supply ring gear so that its hole coincides with that of the loading ring assy.

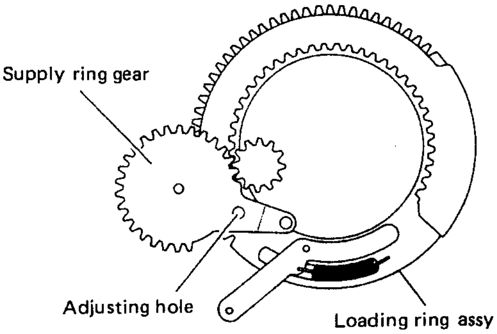

Supply ring gear
Adjusting hole
Loading ring assy

Fig. 1-6-18 Supply ring gear

6. Cam switch assembly
   Set the cam switch assembly so that the notch of its gear teeth coincides with both the rectangle hole Ⓐ and the hole of the main deck.

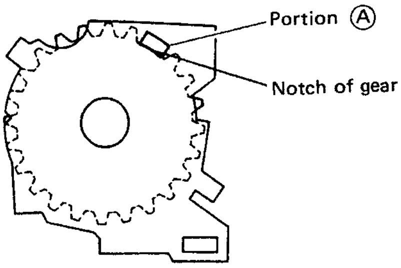

Portion Ⓐ
Notch of gear

Fig. 1-6-19 Cam switch assembly

After completion of the above steps 1 through 6, make sure to confirm that respective phases are correct.
For disassembling, proceed through the above steps in the reverse order.

1.7 INSPECTION AND MAINTENANCE

Since this model is equipped with rotary parts and other parts which may wear as time passes, it is important to clean the tape transport system and rotary parts as well as oiling and greasing rotary parts.

Besides such maintenance, periodic replacement of worn and consumable parts is required.

*Note: **Encircled numeral(s) corresponds to the item number shown in Table 1-7-1.***

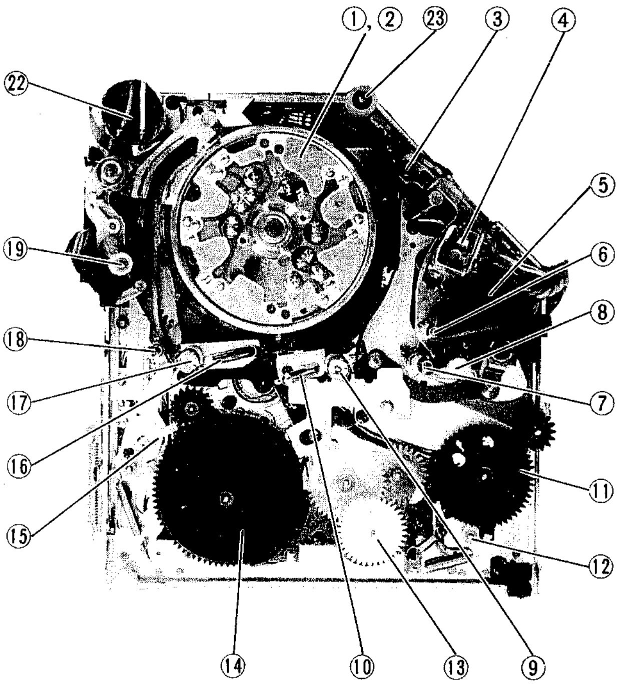


Fig. 1-7-1 Location of main mechanism parts (Top view)

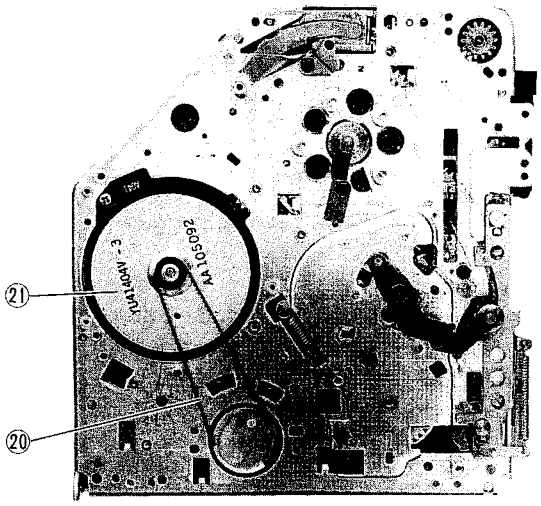


Fig. 1-7-2 Location of main mechanism parts (Bottom view)

1.7.1 Standard maintenance/inspection schedule of main components

Table 1-7-1 indicates the standard servicing period by component and kind of servicing. In practice, however, the indicated periods will widely vary according to environmental and using conditions. Nunfulfilment of the maintenance work not only shortens the standard period sharply but also influences other components badly.
Also be aware that rubber parts may possibly deform and age as time passes even when the set is not used.

System	Symbol No.	Parts Name	Assy	Periodic servicing schedule (operation hours)								
				250	500	750	1000	1250	1500	1750	2000	3000
Tape transport system	19	Impedance roller		★	★	★	★	★	★	★	★	★
	16	Supply slant pole	a									
	17	Supply guide roller	a									
	18	Tension pole	a									
	7	Middle pole	a									
	6	Take-up guide pole A	a									
	3	Take-up guide pole B	a									
	9	Take-up guide roller	a									
	10	Take-up slant pole	a									
	8	Capstan	a									
	2	Lower drum	a									
	1	Upper drum	a	★	★	☆	●	★	★	☆	●	●
	4	A/C head	a	★	★	★	★	★	★	★	★	●
	5	Pinch roller	a	★	★	★	★	★	★	★	★	●
	23	Head cleaner	a	○	○	○	●	○	○	○	●	●
Drive system	21	Capstan motor	a								●	
	20	Belt					○				●	○
	22	Mode control motor										●
	11	Take-up clutch	a	△	△	△	▲	△	△	△	▲	▲
	14	Supply reel disk	a	△	△	△	▲	△	△	△	▲	▲
	13	Center pulley	a				○				○	○
	12	Search brake lever		★	☆	★	☆	★	☆	★	☆	☆
Other	15	Tension band	a				○				○	○

★ : Cleaning
☆ : Cleaning (or Replacement if necessary)
△ : Lubrication
a : Will be provided as assembly parts for replacement
▲ : Lubrication (or Replacement if necessary)
● : Replacement
○ : Inspection or Replacement if required

Table 1-7-1 Maintenance schedule

1.7.2 Remarks

1. Cleaning

1) For cleaning of the upper drum (particularly video heads), use fine-woven cotton cloth or Kimwipe with alcohol soaks through. Do not move the cloth but turn the upper drum counterclockwise.

   Note: *Make sure not to move the cloth in the vertical direction to the video head, since it may cause damage of the video heads.*

2) For cleaning of parts of the tape transport system except the upper drum, use fine-woven cotton cloth or cotton swab soaked alcohol.
3) After cleaning, confirm that the cleaned parts are completely dry before loading the deck with cassette tape.

2. Applying oil and grease

1) Periodical oiling and greasing are not required but should be done to new parts when replacing. If oil and grease on the other parts of the other party are old and dirty, wipe them clean and apply new oil or grease.
2) For parts and points to apply oil and grease, refer to the exploded view of the mechanism assembly (M3). Table 1-7-2 specifies oil and grease to be used.
3) When oiling, clean the objective parts with alcohol first and apply one or two drop(s) of oil. Too much oiling causes rotary parts to slip because of oil leakage.

Classification	Name	Part No.	Symbol in drawing
Grease	Moriton Grease No.1	MOS2-C	AA
Oil	Cosmo Hydro HV100	YTU94027	BB

Table 1-7-2 Specific oil and grease to be used

3. Checkup

After replacement of the supply reel disk and tension band, make sure to inspect and adjust back tension according to the adjustment procedure of the deck section.

4. Replacement

Replacement parts which are supplied as assembly parts are indicated by "a" in the "Assy" column of Table 1-7-1.
For respective parts numbers, refer to the parts list of the mechanism assembly.

SECTION 2
DECK SECTION ADJUSTMENT

2.1 PREPARATION

2.1.1 Precaution

In most cases, if the deck section is in need of electrical adjustment, it results from replacement of worn mechanical parts or video heads.

In the event of malfunction with electrical circuits, troubleshooting with the aid of proper test instruments must be done first, and then commence necessary repair, replacement and adjustment, etc.

1. When loading the deck with a cassette tape, make sure to remove the cassette door beforehand since it contacts with the drum as it is assembled.
2. In case of wiring to chip test points for measurement, use IC clips, etc. to avoid any stress.
3. Since connectors are fragile, carefully handle them when disconnecting and connecting.
4. To operate the deck section with the VTR board removed from the mechanism chassis, set the push switch (SW1) to ON.

2.1.2 Connection for adjustment

Disassemble the deck section from the other units, and connect it with test equipment as shown in Fig. 2-1-1.

Connector	No. of pins	Label No.	Connection
①	8	PPU58855A-8	$\boxed{1}\boxed{8}$ DISPLAY CN1 ↔ $\boxed{0}\boxed{1}$ VTR CN1
②	12	YUJ41361B-12	OPERATION (DECK) CN1 ⬌ $\boxed{0}\boxed{1}$ VTR CN5
③	4↔10	YUJ41358B-10T	Y/C Separator Cable ⬌ $\boxed{0}\boxed{1}$ VTR CN15
④	3	YUJ40095A-3	$\boxed{0}\boxed{1}$ VTR CN17 ↔ $\boxed{0}\boxed{5}$ TRIGGER CN1

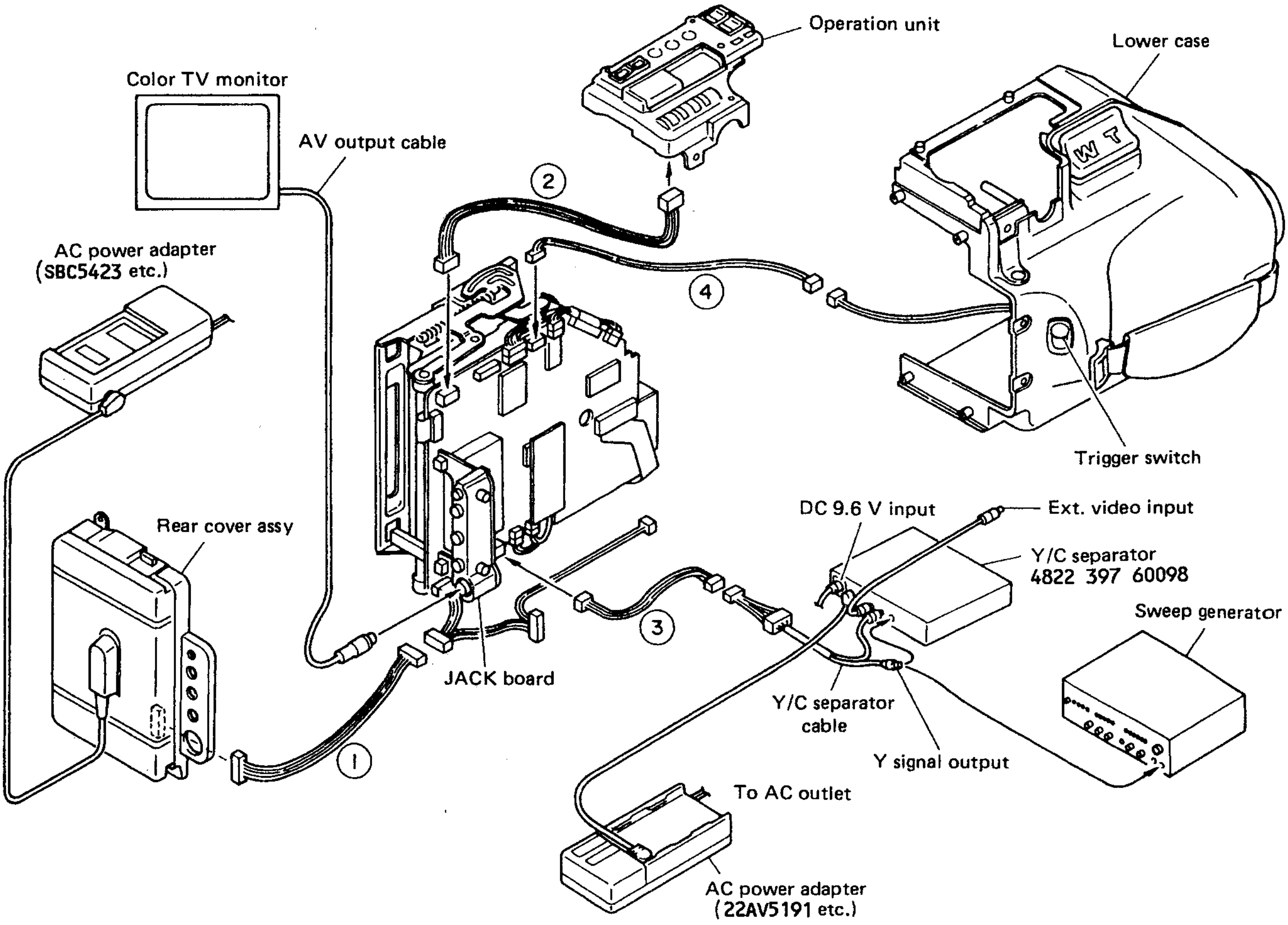
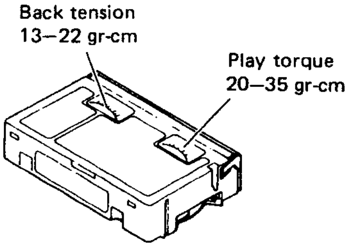
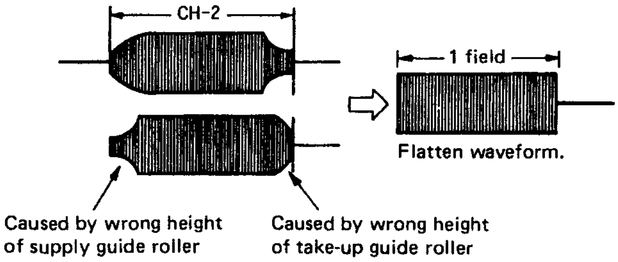
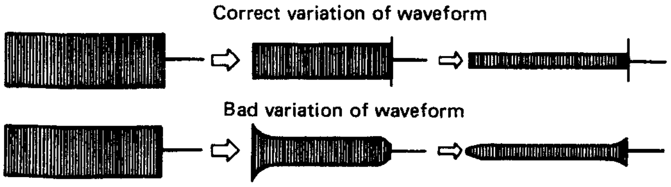

Operation unit
Lower case
Color TV monitor
AV output cable
②
AC power adapter
(SBC5423 etc.)
④
Trigger switch
DC 9.6 V input
Ext. video input
Rear cover assy
Y/C separator
4822 397 60098
Sweep generator
③
JACK board
Y/C separator
cable
①
Y signal output
To AC outlet
AC power adapter
(22AV5191 etc.)

Fig. 2-1-1 Standard setup for deck section adjustment

2.2 SERVO CIRCUIT AND INTERCHANGEABILITY

Note: • *This adjustment must be performed after the upper drum assembly or the lower drum assembly is replaced.*
• *Unless otherwise specified, measurement points and adjustment parts are located on* $\boxed{0}\boxed{1}$ *VTR board.*

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	Back tension	• REC	• Cassette torque meter  Back tension 13–22 gr-cm Play torque 20–35 gr-cm **Fig. 2-2-1** Cassette torque meter	• Cassette torque meter		1) Set a cassette torque meter onto the deck and measure the back tension in the standard REC mode to confirm that the back tension is 13–22 gr-cm. 2) If not, replace the tension band. When the value widely fluctuates in the measurement, replace the supply reel disk. 3) With the cassette torque meter, confirm that the play torque is 20–35 gr-cm. If necessary, replace the take-up clutch assy.
2	Tape pattern	• Play	• Alignment tape `Stairstep` `(MHPE-C)` • Tracking: Manual  CH-2 1 field Flatten waveform. Caused by wrong height of supply guide roller Caused by wrong height of take-up guide roller **Fig. 2-2-2** FM waveform  Correct variation of waveform Bad variation of waveform **Fig. 2-2-3** FM waveform	• TP502 (PB FM) • TP109 (DRUM FF) (Ext.trigger)	• Supply/ Take-up guide roller	1) Observe signal at TP502 with external trigger from TP109. 2) Play back the `Stairstep` signal of the alignment tape, and maximize the FM waveform by the tracking button. 3) If the observed FM waveform is not flat, adjust the height of the supply or take-up guide roller with an ordinary screwdriver (–). **Note:** *Slowly turn the guide roller to prevent tape damage.* 4) By operating the tracking button (both in + and – directions) in the manual tracking mode, vary the output level of the FM waveform from maximum to minimum and vice versa to confirm that the waveform varies nearly in a flat shape. 5) When the FM waveform breaks in the level varying process, subtly adjust the height of guide rollers at every breaking point so that the waveform varies as flat as possible. Repeat the above steps 4) and 5) several times to confirm that the waveform is flat as a whole. 6) Since relative positions of guide rollers may possibly change in the course of the adjustment, return to the Stop mode and then set to the Play mode again for confirmation.

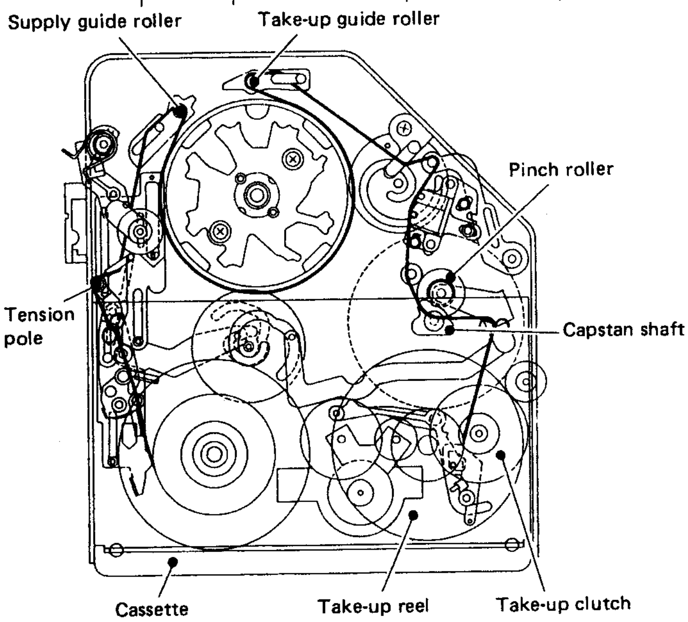
<table>
<tr><th>No.</th><th>Item</th><th>Mode</th><th>Signal
& Setting</th><th>Measurement Point</th><th>Adjustment Parts</th><th>Adjustment Procedure</th></tr>
<tr><td></td><td></td><td>• REC
↓
PB</td><td>• Alignment tape Stairstep (MHP-C or MH-C1)</td><td></td><td></td><td rowspan="2">7) Play back the Stairstep of the alignment tape and repeat the above step 4) to confirm that the waveform is nearly flat as it was adjusted.
Note: *In comparison of the waveform adjustment in LP mode with that in SP mode, give priority to LP pattern adjustment for the best setting.*
8) Record and playback the signal to confirm that the FM waveform is flat.
Note: *If there is FM dropout at the supply side (tape inlet of the drum) in REC-PB, check the back tension first and adjust the parallelism with the alignment tape for the best setting, and then turn the supply guide pole counterclockwise at an angle of 30° approx.*
9) Through the above adjustments, make sure of no wrinkling/damage in the tape around the impedance roller and take-up guide pole in Loading/Unloading, Search Rewind, and at mode shift from Search Rewind to Play.
If tape wrinkling or damage occurs around the take-up guide pole, adjust the contact (angle) of the audio/control head to transport the tape correctly along the lower flange of the guide pole.</td></tr>
<tr><td></td><td colspan="5">

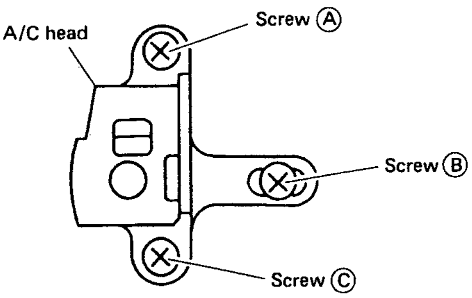
Fig. 2-2-4 Tape transport system</td></tr>
<tr><td>3</td><td>A/CTL head height & azimuth</td><td>• PB</td><td>• Alignment tape SP stairstep (Audio 7kHz) (MHPE-C or MH-C2)</td><td>• TP32 (AUDIO OUT)</td><td>• A/CTL head</td><td rowspan="2">1) Play back the 7 kHz segment of the alignment tape and observe waveform at TP32.
Note: *When the output level is approx. −6 dBs (1.1 Vp-p, 0.39 Vrms) and the level fluctuation is less than −2 dB, adjustment is not required.*
2) If necessary, turn the screw Ⓐ (reference), Ⓑ (bent forward) and Ⓒ (azimuth) gradually (at an angle of 45° approx.) in the same direction to obtain the maximum output level.
3) As final fine adjustment, adjust the screw Ⓑ for minimum level fluctuation and the screw Ⓒ for maximum output level.</td></tr>
<tr><td></td><td colspan="5">

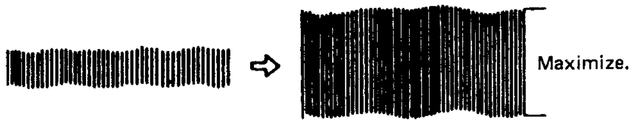
Fig. 2-2-5 A/C head


Fig. 2-2-6 Audio signal</td></tr>
</table>

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
4	Phase of control head (X value)	• PB	• Alignment tape **Stairstep** (MHPE-C or MH-C2) • Tracking: Manual	• TP502 (PB FM) • TP109 (DRUM FF) (Ext.trigger)	• Control head	1) Play back the **Stairstep** signal of the alignment tape and observe waveform at TP502 with external trigger (+) from TP109. 2) Operate the tracking button in the manual tracking mode and confirm that the FM output level is maximum at the center position of the tracking button as shown in Fig. 2-2-8. 3) If necessary, slightly loosen the setscrews Ⓓ and Ⓔ and insert the tip of the A/C head positioning tool into the notch and guide hole to move the A/C head fully in the direction of the capstan to the extent. 4) Gradually move the A/C head toward the drum to find the position where the FM output level is maximum for the first time ('a—b' in Fig. 2-2-8). 5) Fine adjust the phase of the A/C head and tighten the setscrews Ⓓ and Ⓔ at the point c which is the midpoint between a and b. 6) Confirm that the above steps 2) and 5) are satisfactory at the same time. If not, repeat the steps 3) through 5).

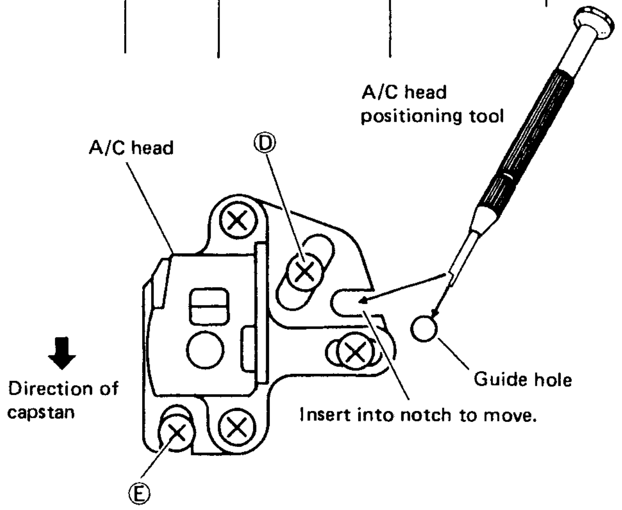


Fig. 2-2-7 Phase of control head

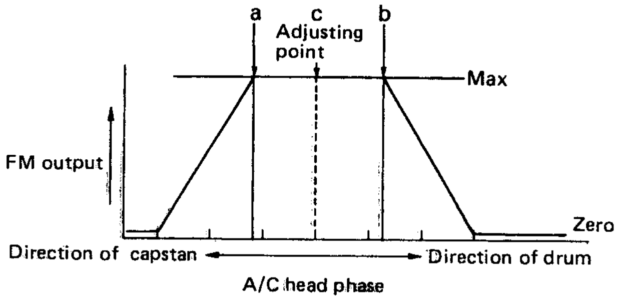
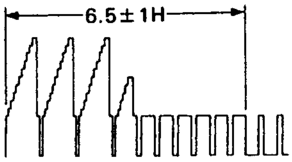


Fig. 2-2-8 Phase adjustment point of control head

No.	**Item**	**Mode**	**Signal & Setting**	**Measurement Point**	**Adjustment Parts**	**Adjustment Procedure**
5	PB switching point	• PB	• Alignment tape Stairstep (MHPE-C or MH-C2) • Tracking: Manual  **Fig. 2-2-9** PB switching point	• TP508 (VIDEO OUT) • TP109 (DRUM FF) (Ext.trigger)	• R103 (PB SW POINT)	1) Play back the stairstep signal of the alignment tape. 2) Observe waveform at TP508 with external trigger (–) from TP109. 3) Adjust R103 so that the trigger point is 6.5H before the fall point of V. sync. signal.
6	Horizontal free running frequency	• PB	• Alignment tape Stairstep (MHPE-C or MH-C2)	• TP401 (HD) • TP402 (Y OUT) • TP1 (GND)	• R404 (Fh)	1) Play back the stairstep signal of the alignment tape. 2) Connect a frequency counter to TP401 and shortcircuit between TP402 and TP1 with jumper wire. 3) Adjust R404 so that the frequency counter reads $15.750^{+0}_{-0.5}$ kHz.

2.3 PRE AMP CIRCUIT

Note: This adjustment should be performed only when self-recording picture has flicker and B/W reversal after replacing the upper drum or Pre-amp board. It is necessary to correct each head characteristic obtain the optimum picture quality.

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	Video Head Resonance /Fo	• PB	• MH-C2 RF sweep	• RD1 (PB FM) 0 3 PRE REC • TP109 (DRUM FF) 0 1 VTR	• Separate chart	1) Play RF sweep portion of MH-C2. 2) Connect the oscilloscope RD1 with external trigger (–) TP109. 3) Vary the tracking CTL to get the maximum FM output at RD1. 4) For more easily obsorving the waveform, adjust VR01 for maximum output in the 4.8 MHz portion. 5) Adjust VC01 to set the resonance point to 4.8 MHz, and make a note of the 4.8 MHz and 2 MHz (Q ratio) as shown in Fig. 2-4-1. 6) Repert step (4) through (6) for CH-2 to CH-4 according to the left side table. 7) At the ratio of step 5) adjust each Q ratio to that of the least effecient channel.

	Adjustment (R)	Adjustment (C)
CH-1	VR01	VC01
CH-2	VR02	VC02
CH-3	VR03	VC03
CH-4	VR04	VC04

Table 2-3-1 Adjust point

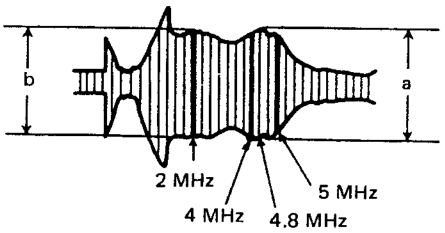

b
a
2 MHz
4 MHz
4.8 MHz
5 MHz

Fig. 2-3-1 PB FM

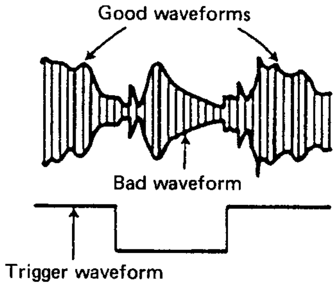

Good waveforms
Bad waveform
Trigger waveform

Fig. 2-3-2 PB FM (Trigger waveform)

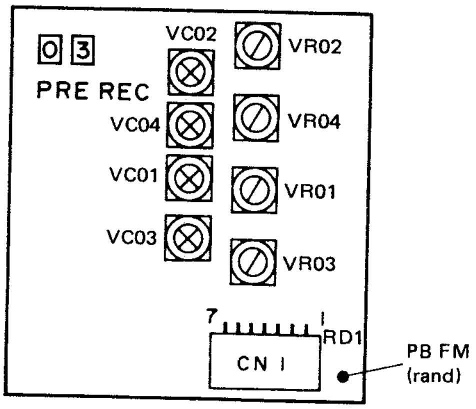
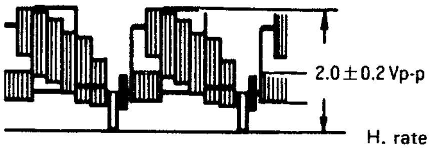
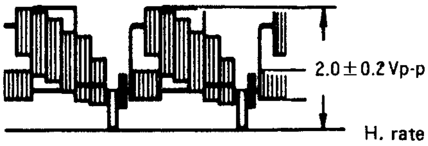
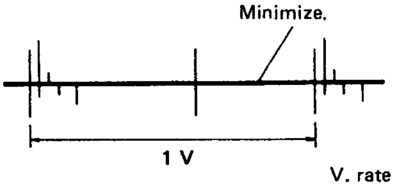
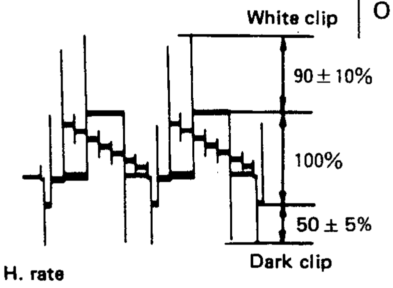
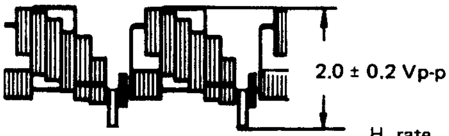
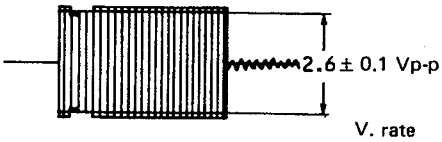
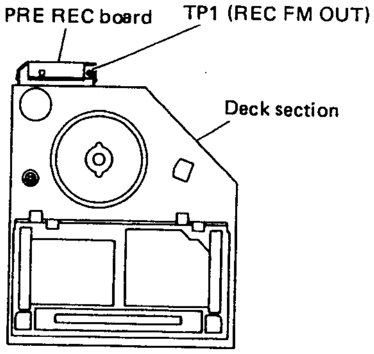
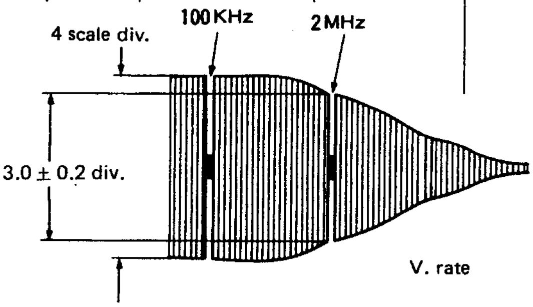

0 3
PRE REC
VC02
VR02
VC04
VR04
VC01
VR01
VC03
VR03
7
1
RD1
CN 1
PB FM
(rand)

Fig. 2-3-3 PRE REC board VR layout

2.4 LUMINANCE (Y) SIGNAL CIRCUIT

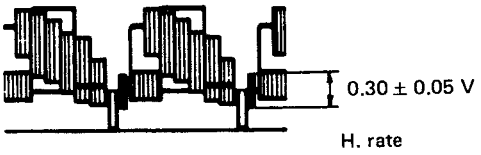
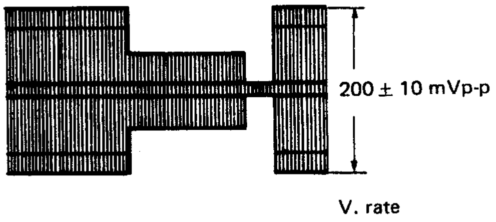
Note: • *Before proceeding to do each adjustment, check the adjustment value.*
• *Unless otherwise specified, all adjustment points and adjustment parts are located on* $\boxed{0}\boxed{1}$ *VTR board.*

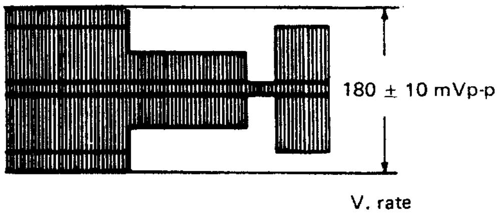
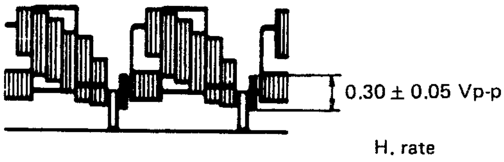
No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	EE Y level	•EE	•Color bar  Fig. 2-4-1 EE Y level	•TP508 (VIDEO OUT)	•R658 (EE Y LEVEL)	1) Adjust R658 so that Y signal level is 2.0 Vp-p at TP508.
2	PB Y level	•PB	•Alignment tape Color bar (MHVE-2C or MH-C2)  Fig. 2-4-2 PB Y level	•TP508 (VIDEO OUT	•R653 (PB Y LEVEL)	1) Play back the color bar signal of the alignment tape. 2) Adjust R653 so that Y signal level is 2.0 Vp-p at TP508.
3	YNR input level	•PB	•Alignment tape Color bar (MHVE-2C or MH-C2)  Fig. 2-4-3 1H DL Y level	•TP502 (PB DEMOD Y) •TP503 (PB 1H DL Y)	•R660 (1H DL SIG LEVEL)	1) Play the color bar signal of the alignment tape. 2) Connect one channel of dual trace oscilloscope to TP502 and other channel to TP503. Change CH-2 to reverse (INV) mode and align both channel's VOLTs/DIV. SW to the same range and select Virtical mode SW to ADD. 3) Adjust R660 for minimum level in order to adjust to the same level.
4	White clip	•EE	•Color bar  Fig. 2-4-4 White clip	•TP504 (EMPHASIS OUT)	•R655 (WHITE CLIP) R654 (DARK CLIP)	1) Adjust R655 and R654 at TP504 so that white clip level becomes 90% and dark clip level becomes 50% respectly.

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
5	Carrier & deviation	• REC • REC ↓ PB	• No input signal • Color bar	• TP501 (REC FM) • TP508 (VIDEO OUT)	• R656 (CARRIER) • R657 (DEVIATION)	**Note:** *This adjustment should be performed only when EE and playback of the prerecorded tape are normal, while the sync at selfrecording is distorted (poor carrier set) or S/N is extremely poor (poo deviation).* 1) Connect a frequency counter to TP501, and adjust R656 for 4.3 MHz ± 100 kHz without input signal. 2) Record the color bar signal and then play the same portion. Confirm that TP508 output level is 2.0 Vp-p. 3) If it is out of the above specification, adjust R657 during recording and repeat above step 2).
		 **Fig. 2-4-5**				
6	REC FM level	• REC	• Color bar	• TP1 (REC FM OUT) [0][3] PRE REC	• R651 (REC FM LEVEL)	1) Connect the oscilloscope to TP1 of the PRE REC board. 2) Adjust R651 so that FM level of the pedestal portion is 2.6 Vp-p.
		 **Fig. 2-4-6(A)** REC FM level				 **Fig. 2-4-6(B)** Test point of PRE REC board
7	Video EQ	• REC ↓ PB	• Color sweep	• TP508 (VIDEO OUT)	• R652 (PB RF EQ)	**Note:** *This item should be adjusted when playback of self-recorded picture is not sharp (too low 2 MHz component) after replacement of the upper drum or when there is B/W reversal (too high 2 MHz component).* 1) Record the color sweep signal and play it back to observe waveform at TP508. 2) Set the 100 kHz marker of the color sweep signal for 4 scale divisions on the oscilloscope screen, and adjust R652 so that the 2 MHz marker is for 3.0 scale divisions. **Note:** *After reassembling the deck and camera sections, record a high contrasty object and play the recorded pictures respectively to confirm that there is no B/W reversal in the most contrasty part and the picture is clear and sharp on the whole.*
		 **Fig. 2-4-7** Video EQ				

2.5 COLOR (C) SIGNAL CIRCUIT

Note: • *Before proceeding to do each adjustment, check the adjustment value.*
• *Unless otherwise specified, all adjustment points and adjustment parts are located on 01 VTR board.*

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	4.43 MHz VXO	• PB	• Alignment tape Color bar (MHVE-2C or MH-C2)	• TP602 (VXO OUT-1)	• C629 (VXO)	1) Connect a frequency counter to TP602. 2) Adjust C629 so that the frequency becomes 4.433619 MHz ± 50 Hz.
2	320 fH VCO	• EE	• No input signal	• TP604 (SUB BM OUT) • TP1 (GND) • TP603 (VCXO OUT-2) • TP109 (DRUM FF)	• R666 (320 fH VCO)	1) Connect a frequency counter to TP604. 2) Connect a jumping wire between TP1 and TP603. 3) Confirm 0 V (L) at TP109. When it is (H), turn off the power once and turn it on again. Repeat this operation until the potential becomes (L). 4) Adjust R666 so that the frequency becomes 627.0 ± 2 kHz.
3	EE burst level	• EE	• Color bar  Fig. 2-5-1 EE burst level	TP508 (VIDEO OUT)	• R659 (EE BURST LEVEL)	1) Adjust R659 so that burst level at TP508 is 0.30 V.
4	PB ACC input level	• PB	• Alignment tape Color bar (MHVE-2C MH-C2)  Fig. 2-5-2 PB ACC input level	• TP605 (PB COLOR) • TP109 (DRUM FF) (Ext.trigger)	• R665 (PB COLOR LEVEL)	1) Play back the color bar signal of the alignment tape. 2) Observe waveform at TP605 with external trigger from TP109. 3) Adjust R665 to obtain 200 mVp-p as the higher level of channels.

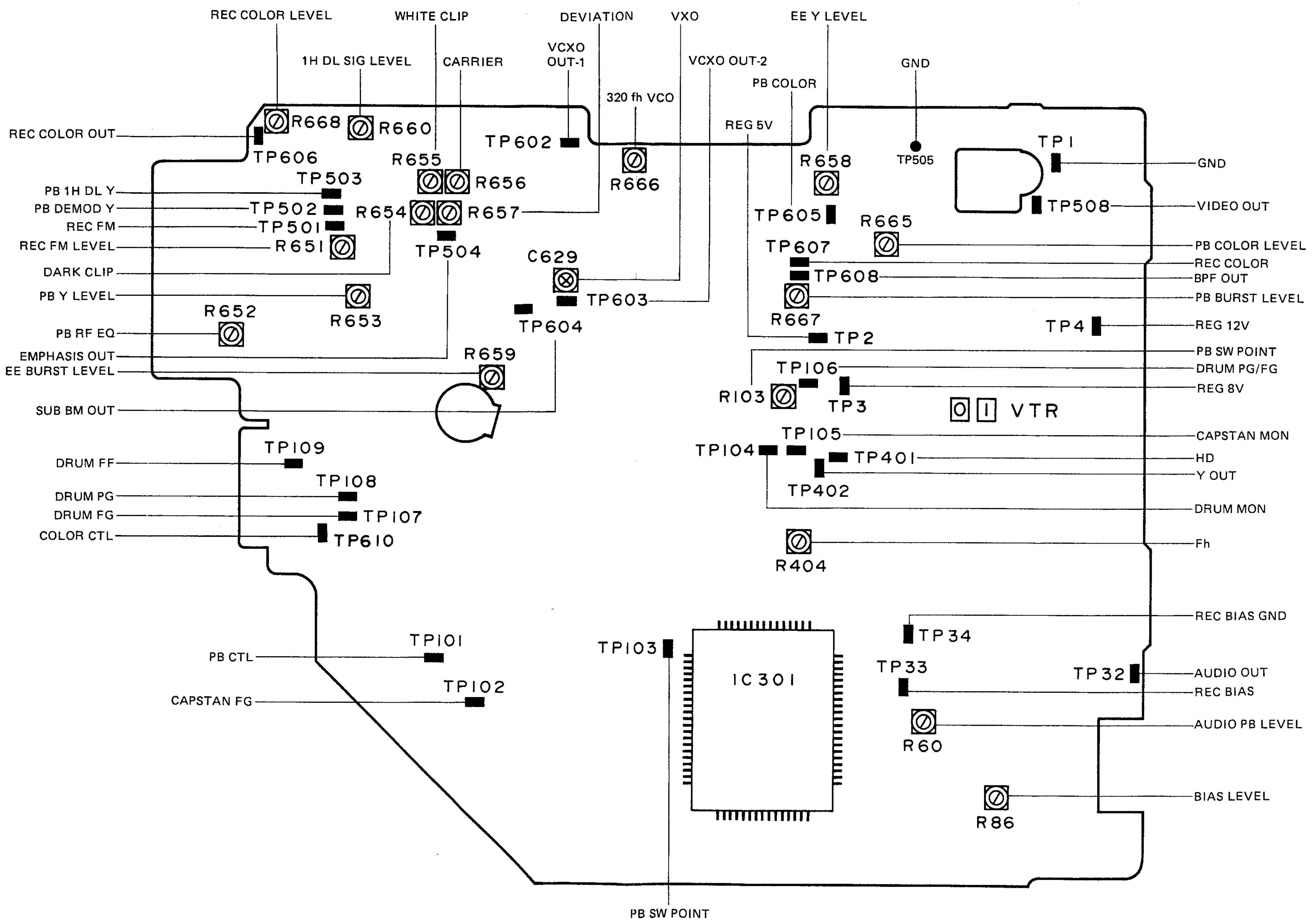
No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
5	REC color level  **Fig. 2-5-3** REC color level	• REC ↓ PB	• Color bar	• TP605 (PB COLOR) • TP109 (DRUM FF)	• R668 (REC COLOR LEVEL)	1) Observe waveform at TP605 with external trigger from TP109. 2) Record color bars and play it back. 3) Adjust R668 so that the higher level of channels is 180 mVp-p.
6	PB color level  **Fig. 2-5-4** PB burst level	• REC ↓ PB	• Color bar	• TP508 (VIDEO OUT)	• R667 (PB BURST LEVEL)	1) Record the color bar signal and play it to observe waveform at TP508 and adjust R667 so that burst level becomes 0.30 Vp-p.

2.6 AUDIO CIRCUIT

Note: *Unless otherwise specified, all adjustment points and adjustment parts are located on* $\boxed{0}\boxed{1}$ *VTR board.*

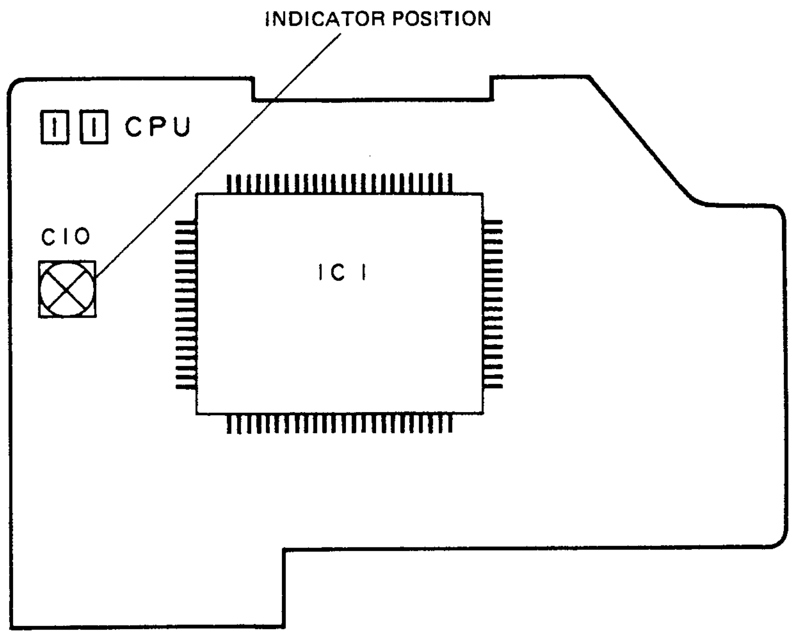
No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	Bias level	• REC	• Non-signal	• TP33 (REC BIAS) • TP34 (REC BIAS GND)	• R86 (BIAS LEVEL)	1) Connect an audio level meter to respective ends of TP33 and TP34. 2) Adjust R86 to obtain −51 dBs (6.5 mVp-p, 2.3 mVrms) in SP REC mode.
2	PB audio level	• EE • REC ↓ PB	• 1 kHz sine wave	• TP32 (AUDIO OUT)	• R60 (AUDIO PB LEVEL)	1) In EE mode, input 1 kHz, −68 dBs (0.9 mVp-p, 0.32 mVrms) sine wave to the external mic. jack. 2) Fine adjust output of the audio level meter so that signal level at pin 8 of the AV jack of the JACK board is −6 dBs (1.1 Vp-p, 0.39 Vrms). 3) In playback of self-recorded signal, adjust R60 so that signal level at TP32 is −6 dBs (1.1 Vp-p, 0.39 Vrms).

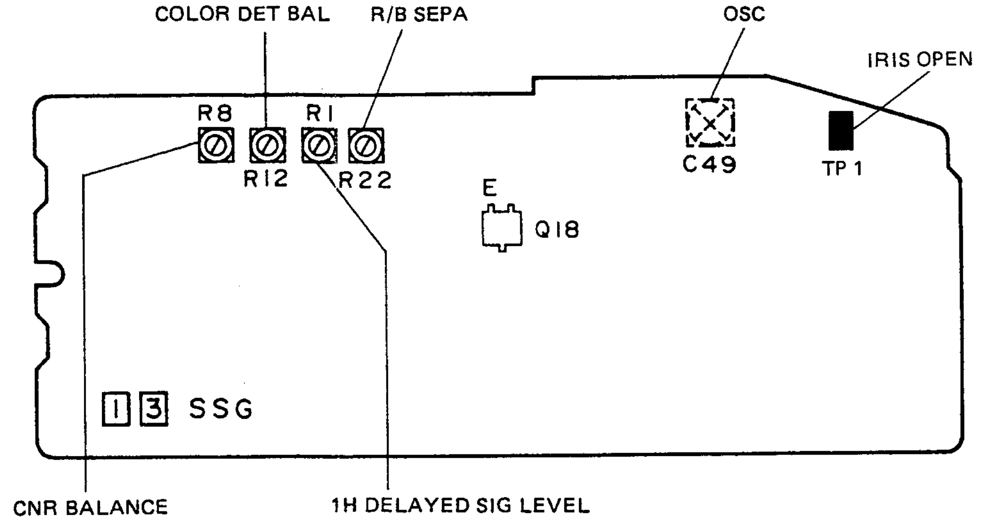
■ ADJUSTMENT ELEMENT LOCATION FOR DECK SECTION

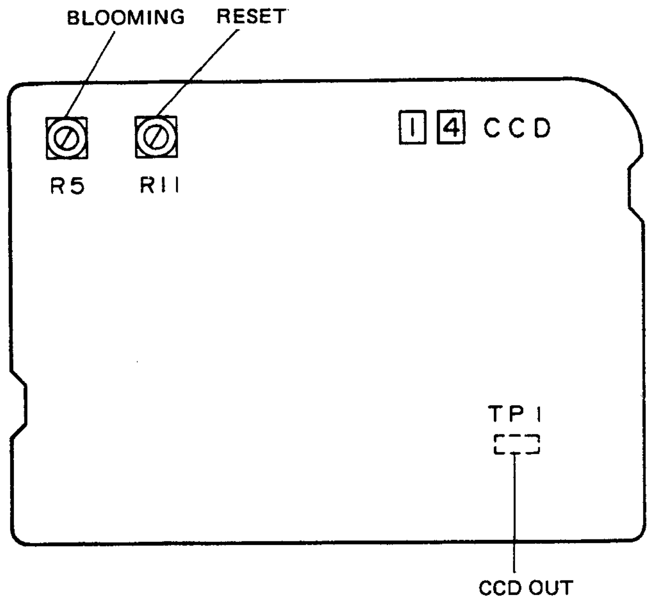

REC COLOR LEVEL
WHITE CLIP
DEVIATION
VXO
EE Y LEVEL
1H DL SIG LEVEL
CARRIER
VCXO OUT-1
VCXO OUT-2
PB COLOR
GND
320 fh VCO
REG 5V
REC COLOR OUT
R668
R660
TP606
TP602
R666
TP505
TP1
R658
GND
TP503
R655
R656
PB 1H DL Y
PB DEMOD Y
REC FM
REC FM LEVEL
TP502
TP501
R651
R654
R657
TP504
TP605
TP508
VIDEO OUT
R665
PB COLOR LEVEL
DARK CLIP
C629
TP607
REC COLOR
TP608
BPF OUT
PB Y LEVEL
TP603
PB BURST LEVEL
R652
R653
R667
TP4
REG 12V
PB RF EQ
TP604
TP2
EMPHASIS OUT
R659
PB SW POINT
EE BURST LEVEL
TP106
DRUM PG/FG
REG 8V
R103
TP3
0 1 VTR
SUB BM OUT
TP105
CAPSTAN MON
TP109
TP104
TP401
HD
DRUM FF
Y OUT
TP108
TP402
DRUM PG
DRUM MON
DRUM FG
TP107
COLOR CTL
TP610
R404
Fh
REC BIAS GND
TP34
TP101
TP103
PB CTL
IC301
TP33
TP32
AUDIO OUT
REC BIAS
TP102
CAPSTAN FG
R60
AUDIO PB LEVEL
BIAS LEVEL
R86
PB SW POINT

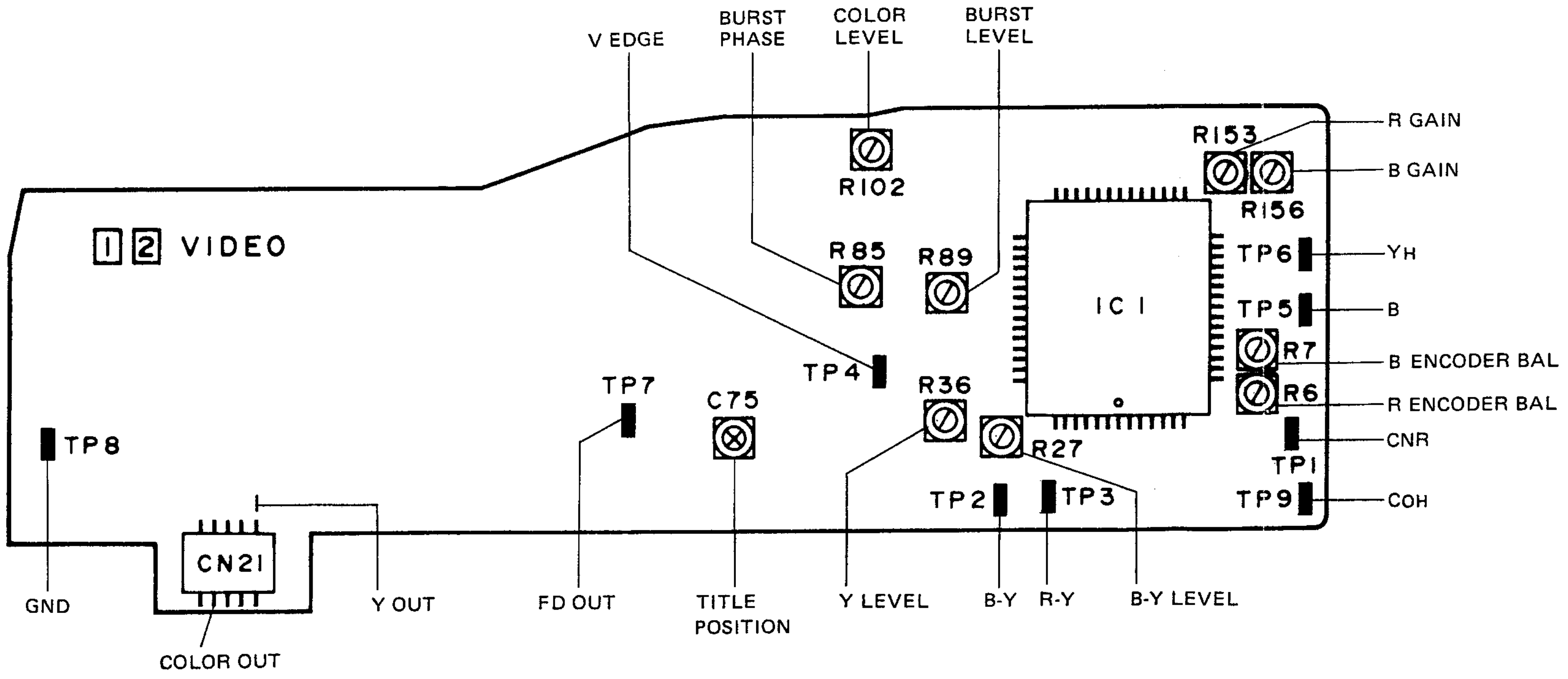
SECTION 3
CAMERA SECTION ADJUSTMENT

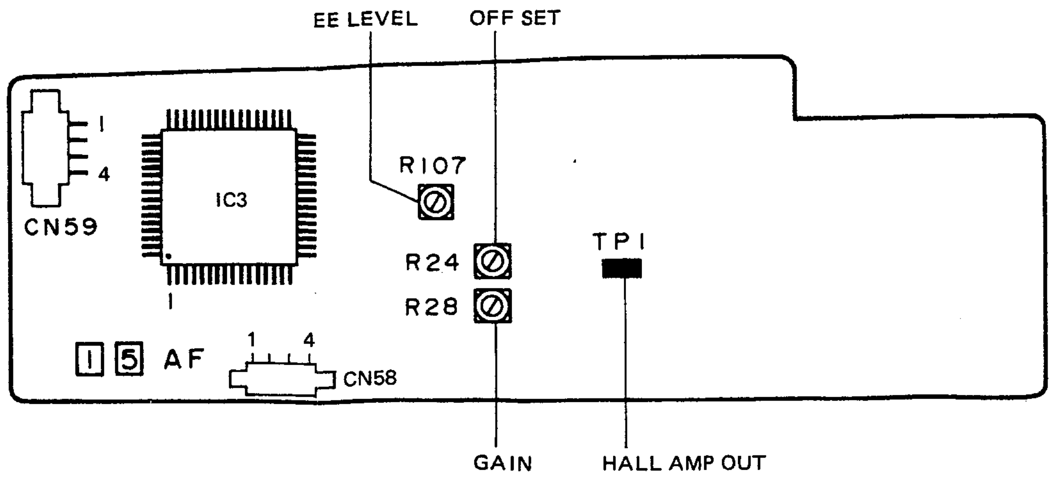
■ ADJUSTEMENT ELEMENT LOCATION FOR CAMERA SECTION


INDICATOR POSITION
1 1 CPU
C10
IC 1


COLOR DET BAL
R/B SEPA
OSC
IRIS OPEN
R8
R1
R12
R22
E
Q18
C49
TP 1
1 3 SSG
CNR BALANCE
1H DELAYED SIG LEVEL


BLOOMING
RESET
R5
R11
1 4 CCD
TP1
CCD OUT


V EDGE
BURST PHASE
COLOR LEVEL
BURST LEVEL
R102
R153
R GAIN
B GAIN
R156
1 2 VIDEO
R85
R89
IC 1
TP6
YH
TP5
B
R7
B ENCODER BAL
R6
R ENCODER BAL
TP4
TP7
C75
R36
R27
TP1
CNR
TP8
TP2
TP3
TP9
COH
CN21
GND
Y OUT
FD OUT
TITLE POSITION
Y LEVEL
B-Y
R-Y
B-Y LEVEL
COLOR OUT


EE LEVEL
OFF SET
1
4
CN59
IC3
R107
R24
R28
TP1
1
1 5 AF
1 4
CN58
GAIN
HALL AMP OUT

3.1 PREPARATION

3.1.1 Precaution

1. Use two or more lighting fixtures (3100 K in color temperature) and light up a test pattern by them at 1200 lux or more.
2. Use a clean test pattern and lens filters.
3. All adjustments must be performed in a room that shuts out light other than the specific illumination.
4. For observing waveform by an oscilloscope at H. rate, connect CH-B of the oscilloscope with pin 1 (Y OUT) of CN21 of $\boxed{1}\boxed{2}$ VIDEO board synchronizing with minus trigger. Connect CH-A to the specified test point for measurement.
5. During adjustments, make sure to shoot a color bar pattern and a gray scale by manual focusing to avoid undesirable zooming to focus on another object by auto focus operation. This camera employs the full range auto focus system (1.5 cm to infinity) and zoom operation and focusing are interlocked.
6. For adjustments, set the camera to the following operation mode unless otherwise indicated.
    - Rehearsal mode
    - Standard shutter speed
    - Manual focusing

3.1.2 Basic operation of E. VR adjuster

For the auto white balance adjustment described in Section 3.3.2, use the E. VR adjuster according to the following procedure.

1. Connect the E. VR adjuster to the camera with no power supplied to the both.
2. Turn on the E. VR adjuster by switching the POWER ON/RESET button. (All LEDs light.)
3. Connect the camera's power cable to an AC power adapter.
4. Press the START button of the E. VR adjuster.
5. Turn on the camera. (Indication is displayed in the TV monitor.)
6. Proceed to do the auto white balance adjustment according to the description of Section 3.3.2.
7. After the adjustment, turn off the E. VR adjuster first and then turn off the camera, and disconnect them.

3.1.3 Connection for adjustment

Referring to Section 1, disassemble the camera section from other units and make connections as follows.

Connector	No.of pins	Label	Connection
①	8	PPU58655A-8	$\boxed{1}\boxed{8}$ DISPLAY CN1 ⟷ $\boxed{0}\boxed{1}$ VTR CN1
②	9	PPU58655A-9	$\boxed{1}\boxed{7}$ JUNCTION CN2 ⟷ $\boxed{1}\boxed{1}$ CPU CN16
③	12	YUJ41361B-12	OPERATION(DECK) CN1 ⬌ $\boxed{0}\boxed{1}$ VTR CN5
④	10	YUJ41361B-10	$\boxed{1}\boxed{2}$ VIDEO CN21 ⬌ $\boxed{0}\boxed{1}$ VTR CN15
⑤	7	YUJ40095A-7	$\boxed{1}\boxed{1}$ CPU CN15 ⟷ Auto white sensor
⑥	16	YUJ41358B-16T	$\boxed{1}\boxed{1}$ CPU CN 11 ⬌ $\boxed{0}\boxed{1}$ VTR CN14 EVR ADJUSTER

Note: *Adjustments except "Auto White Balance adjustment (Sect. 3.3.2)" can be performed as the camera section and the deck section are combined.*

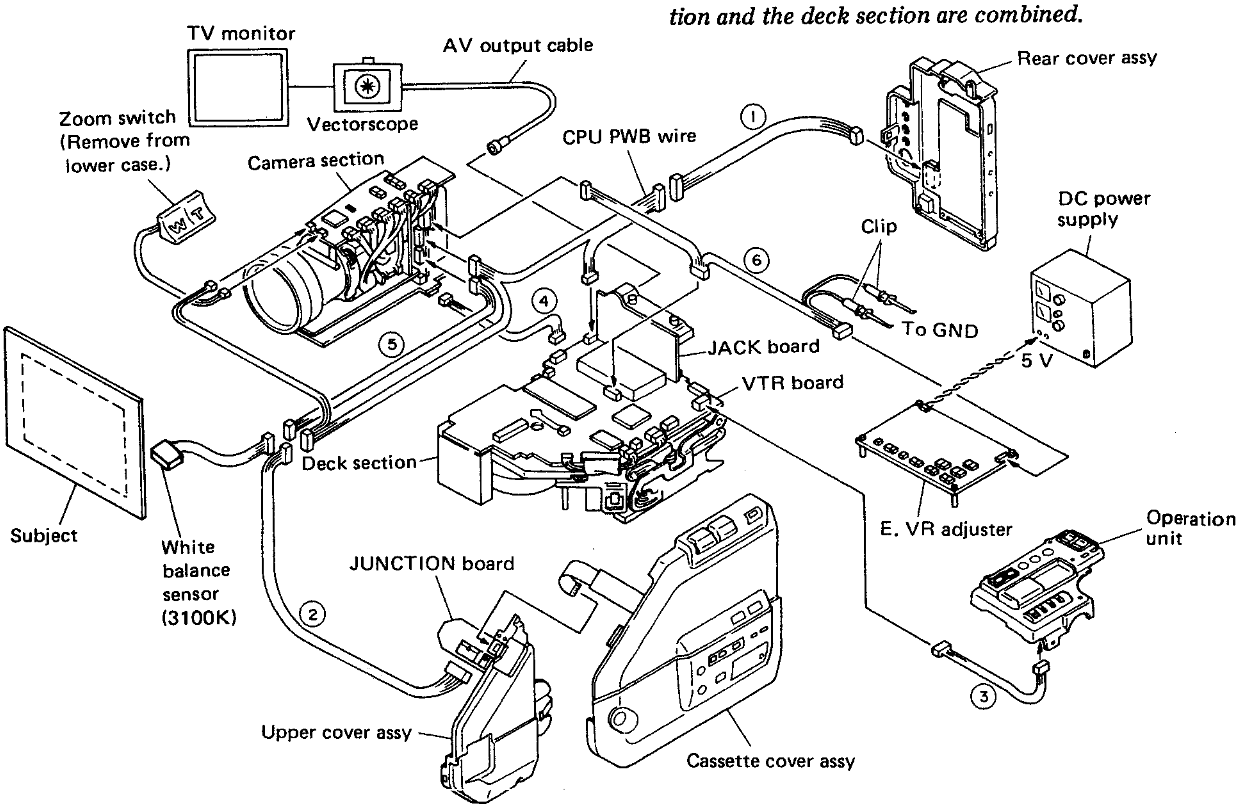
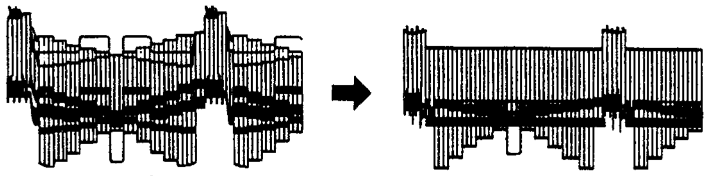
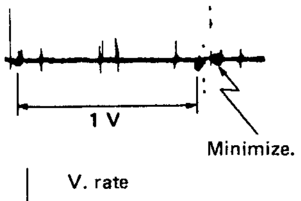
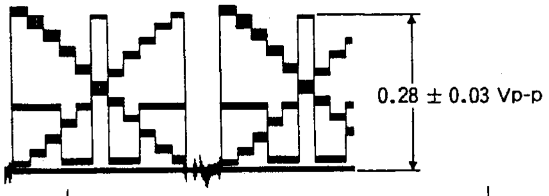
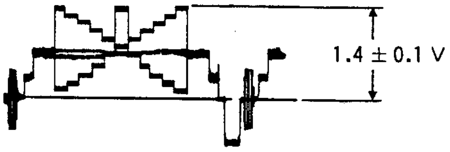

TV monitor
AV output cable
Rear cover assy
Zoom switch (Remove from lower case.)
Vectorscope
CPU PWB wire
①
Camera section
DC power supply
Clip
⑥
④
⑤
To GND
JACK board
5 V
VTR board
Deck section
Subject
White balance sensor (3100K)
E. VR adjuster
Operation unit
JUNCTION board
②
③
Upper cover assy
Cassette cover assy

Fig. 3-1-1 Standard setup for camera section adjustment

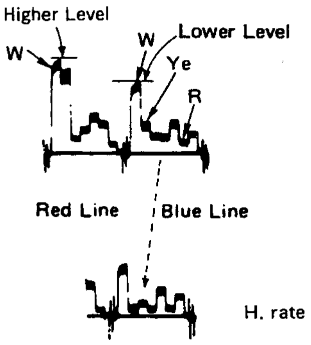
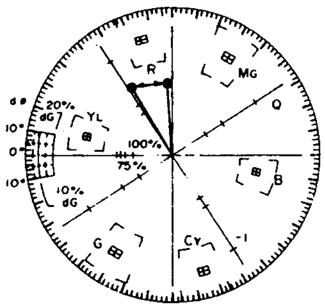
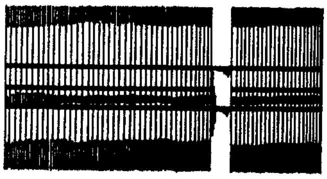
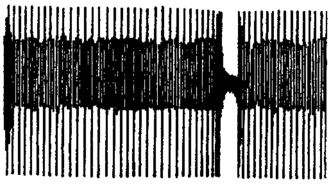
3.2 LUMINANCE (Y) SIGNAL CIRCUIT

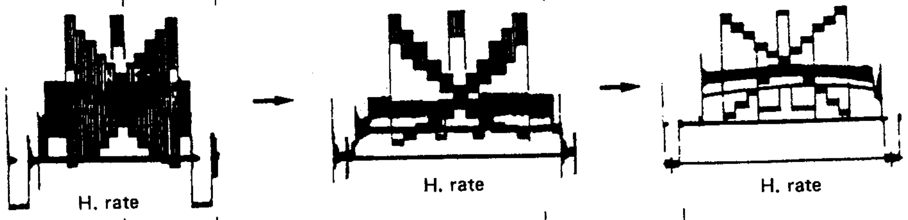
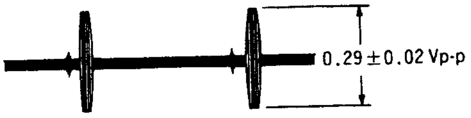
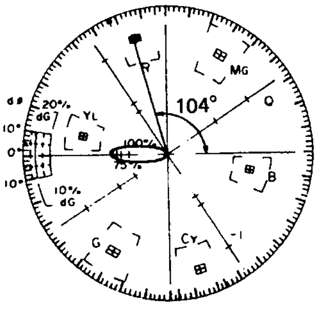
No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	Reset bias	• EE	• Gray scale  Fig. 3-2-1 CCD OUT	• TP1 (CCD OUT) $\boxed{1}\boxed{4}$ CCD	• R11 (RESET) $\boxed{1}\boxed{4}$ CCD	1) Pick up the gray scale and observe waveform at TP1. 2) Adjust R11 to flatten and maximize the waveform.
2	Osc. freq.	• EE		• Q18 emitter $\boxed{1}\boxed{3}$ SSG	• C49 (OSC) $\boxed{1}\boxed{3}$ SSG	1) Connect a frequency counter to the emitter of Q18 of the SSG board and adjust C49 to obtain 9.53496 MHz.
3	Vertical enhancer balance	• EE	• Gray scale  Fig. 3-2-2 V. edge	• TP4 (V. EDGE) $\boxed{1}\boxed{2}$ VIDEO	• R1 (1H DELAYED SIGNAL LEVEL) $\boxed{1}\boxed{3}$ SSG	1) Pick up the gray scale and observe waveform at TP4. 2) Adjust R1 to minimize average level of the waveform.
4	Hall element	• EE	• Iris: Closed • Iris: Open • Gray scale	• TP1 (HALL AMP OUT) • CN59 pin 4 $\boxed{1}\boxed{5}$ AF • TP8 (GND) $\boxed{1}\boxed{2}$ VIDEO • TP2 (REG 5 V) $\boxed{0}\boxed{1}$ VTR	• R24 (OFFSET) $\boxed{1}\boxed{5}$ AF R28 (GAIN) $\boxed{1}\boxed{5}$ AF	1) Shortcircuit between pin 4 of CN59 of the AF board and TP8 of the VIDEO board with jumper wire, and close the iris. 2) Connect a digital voltmeter to TP1 and adjust R24 so that the meter reads $1.0^{+0.3}_{-0}$ V DC. 3) Disconnect 1) shortcircuit between CN57, pin 4 and TP8. 4) Shortcircuit between pin 4 of CN59 of the AF board and TP2 of the VTR board with jumper wire, and open the iris. 5) Pick up the gray scale and adjust R28 so that signal level at TP1 is $3.9^{+0}_{-0.1}$ V DC.
5	EE level	• EE	• Gray scale  Fig. 3-2-3 EE level	• TP6 (YH) $\boxed{1}\boxed{2}$ VIDEO	• R107 (EE LEVEL) $\boxed{1}\boxed{5}$ AF	1) Pick up the gray scale and adjust R107 so that waveform level at TP6 is 0.28 Vp-p.

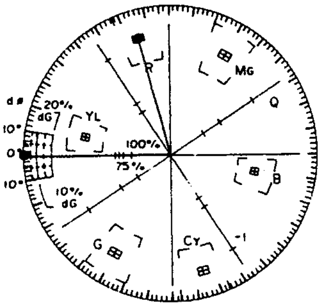
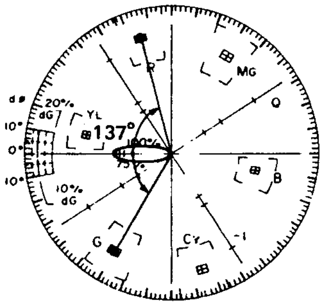
No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
6	Y level	• EE	• Gray scale  Fig. 3-2-4 Y level	• TP508 (VIDEO OUT) $\boxed{0}\boxed{1}$ VTR	• R36 (Y LEVEL) $\boxed{1}\boxed{2}$ VIDEO	1) Pick up the gray scale and observe waveform at TP503. 2) Adjust R36 so that the waveform level becomes 1.4 V.
7	Blooming	• EE		• TV monitor screen	• R5 (BLOOMING) $\boxed{1}\boxed{4}$ CCD	1) Pick up a fluorescent light and adjust R5 to minimize blooming. **Note:** *No matter how for R5 is turned, there will be no change in blooming observed on the monitor. Therefore, set R5 to a position where blooming is minimum and won't change any more.*
8	Indicator position	• EE	• Lens: Closed	• TV monitor screen	• C10 (INDICATOR POSITION) $\boxed{1}\boxed{1}$ CPU	1) Close the lens with the cap. 2) Press the Display mode button to display the 'Low Contrast' indication on the TV monitor screen. 3) Adjust C10 to position the Low Contrast indication in the center of the careen.
9	Title position	• EE		• TP7 (FD OUT) $\boxed{1}\boxed{2}$ VIDEO	• C75 (TITLE POSITION) $\boxed{1}\boxed{2}$ VIDEO	1) Connect a digital voltmeter to TP7 and adjust C75 to obtain 2.0 ± 0.1 V DC as level at TP7.

3.3 COLOR (C) SIGNAL CIRCUIT

3.3.1 Standard indoor mode

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	R/B separation  **Fig. 3-3-1** R/B balance	• EE	• Color bar	• TP5 (B) • CN21 pin 1 (Y OUT) $\boxed{1}\boxed{2}$ VIDEO	• R22 (R/B SEPA.) $\boxed{1}\boxed{3}$ SSG	1) Connect an oscilloscope to TP5. 2) Connect jumper wire to pin 1 of CN21 for external trigger and observe the blue line (see Fig. 3-3-1) with the oscilloscope as it is set to the Hold Off mode. 3) Adjust R22 to equalize levels of the yellow and red lines.
2	Color difference balance	• EE	• Color bar  **Fig. 3-3-2** Color difference balance	• Vectorscope	• R12 (COLOR DET BAL) $\boxed{1}\boxed{3}$ SSG	1) Pick up the color bar pattern. 2) Adjust R12 so that dots meet at the same point on the vectorscope.
3	CNR balance	• EE	• Color bar  **Fig. 3-3-3(A)** CNR balance (1)  **Fig. 3-3-3(B)** CNR balance (2)	• TP1 (CNR) $\boxed{1}\boxed{2}$ VIDEO	• R8 (CNR BALANCE) $\boxed{1}\boxed{3}$ SSG	1) Connect the oscilloscope to TP1. 2) Adjust R8 to flatten the waveform.

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
4	White balance	• EE	• Gray scale  **Fig. 3-3-4** White balance	• TP508 (VIDEO OUT) 0 1 VTR	• R6 (R ENCODER BAL) • R7 (B ENCODER BAL) • R153 (R GAIN) • R156 (B GAIN) 1 2 VIDEO	1) Pick up the gray scale and observe waveform at TP503. 2) Alternately adjust R6 and R7 to minimize carrier leakage in the lower 1st and 2nd steps of the waveform. 3) Next, alternately adjust R153 and R156 to minimize carrier leakage in the higher 1st and 2nd steps of the waveform. 4) Repeat the above steps 2) and 3) to minimize carrier leakage in both.
5	Burst level	• EE	• Lens: Closed  **Fig. 3-3-5** Burst level	• CN21 pin 7 (COLOR OUT) 1 2 VIDEO	• R89 (BURST LEVEL) 1 2 VIDEO	1) Close the lens with the cap. 2) Connect the oscilloscope to pin 7 of CN21. 3) Adjust R89 so that the burst level is 0.29 Vp-p.
6	Burst phase	• EE	• Color bar  R MG 104° Q YL 20% dG 10° 0° 100% 75% 10% dG B G CY -I **Fig. 3-3-6** Burst phase	• Vectorscope	• R85 (BURST PHASE) 1 2 VIDEO	1) Pick up the color bar pattern. 2) Adjust R85 so that the phase of R signal is 104° at an angle (reference position of R's phase) on the vectorscope.

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
7	Color level	• EE	• Color bar  dφ 20% dG 10° 0° 10° YL 100% 75% 10% dG R MG Q B G CY -I **Fig. 3-3-7** Color level	• Vectorscope	• R102 (COLOR LEVEL) [1][2] VIDEO	1) Pick up the color bar pattern. 2) Adjust the gain control of the vectorscope so that the burst level is set on the outer edge of the vectorscope screen. 3) Adjust R102 to set R level so that its dot is positioned in the center of the square ⊞. 4) Confirm that both adjustment results of the item No. 5 'Burst level' and this item (No. 7 'Color level') are satisfactory. If not, repeat the two adjustments alternately until they meet the specifications respectively.
8	Color phase	• EE	• Color bar  dφ 20% dG 10° 0° 10° YL 137° 100% 75% 10% dG R MG Q B G CY -I **Fig. 3-3-8** Color phase	• Vectorscope	• R27 (B-Y LEVEL) [1][2] VIDEO	1) Pick up the color bar pattern. 2) Adjust R27 so that correlative angle of R and G phases is 137° on the vectorscope.

3.3.2 Auto white balance

Note: *This adjustment must be performed only when either IC2 of the CPU board or the white balance sensor is replaced.*

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	R/G, B/G gain select setting	• EE	• White sensor: 3100 K		• 57 (TABLE) • 40 (R/G GAIN SELECT) • 41 (B/G GAIN SELECT) [E. VR]	1) Apply light of 3100 K to the white sensor. 2) Set data of the channel 57 of the E. VR adjuster to '00'. 3) Select channel 40 of the E. VR adjuster and press the MEMORY switch. 4) Select channel 41 of the E. VR adjuster and press the MEMORY switch.
2	G offset setting	• EE	• White balance sensor: Unexposed		• 58 (G OFFSET) [E. VR]	1) Cover the white balance sensor with black cloth etc. so it will not to be exposed to light. 2) Select channel 58 of the E. VR adjuster and press the MEMORY switch.
3	Indoor R/G, B/G setting	• EE	• White sensor: 3100 K		• 42 (INDOOR R/G) • 43 (INDOOR B/G) [E. VR]	1) Apply light of 3100 K to the white sensor. 2) Select channel 42 of the E. VR adjuster and press the MEMORY switch. 3) Select channel 43 of the E. VR adjuster and press the MEMORY switch.
4	Outdoor R/G, B/G setting	• EE	• White sensor: 3100 K • C12 filter		• 44 (OUTDOOR R/G) • 45 (OUTDOOR B/G) [E. VR]	1) Attach a C12 filter to the white sensor and apply light of 3100 K to it. 2) Select channel 44 of the E. VR adjuster and press the MEMORY switch. 3) Select channel 45 of the E. VR adjuster and press the MEMORY switch.
5	VRS, VBS setting	• EE			• 55 (VRS) • 56 (VBS) [E. VR]	1) Select channel 55 of the E. VR adjuster and press the MEMORY switch. 2) Select channel 56 of the E. VR adjuster and press the MEMORY switch.

3.4 AUTO FOCUS ADJUSTMENT

3.4.1 Connection for adjustment

Referring to Section 1, disassemble the camera section from the other units and make connections as follows.

Connector	No. of Pins	Label No.	Connection
①	8	PPU58655A-8	18 DISPLAY CN1 ↔ 01 VTR CN1
②	9	PPU58655A 9	17 JUNCTION CN2 ↔ 11 CPU CN16
③	12	YUJ41361B-12	01 VTR CN5 ⬌ OPERATION (DECK)
④	10	YUJ41361B-10	12 VIDEO CN21 ⬌ 01 VTR CN15
⑤	16	YUJ41361B-16	11 CPU CN11 ⬌ 01 VTR CN14
⑥	30	YUJ41358B-30	12 VIDEO CN24 ⬌ 13 SSG CN32
⑦	14	YUJ41358B-14	11 CPU CN13 ⬌ 13 SSG CN31
⑧	6	YUJ41358B-6	DC-DC converter CN61 ⬌ 15 AF CN52
⑨	16	YUJ41358B-16	11 CPU CN14 ⬌ 15 AF CN51

Set the camera (and camera subjects) so that the distance between the lens surface and a subject is infinity (∞) or 2.0 ± 0.06 m. The setscrew of the infinite sensor can be adjusted through the AF adjustment hole provided on the CCD board.

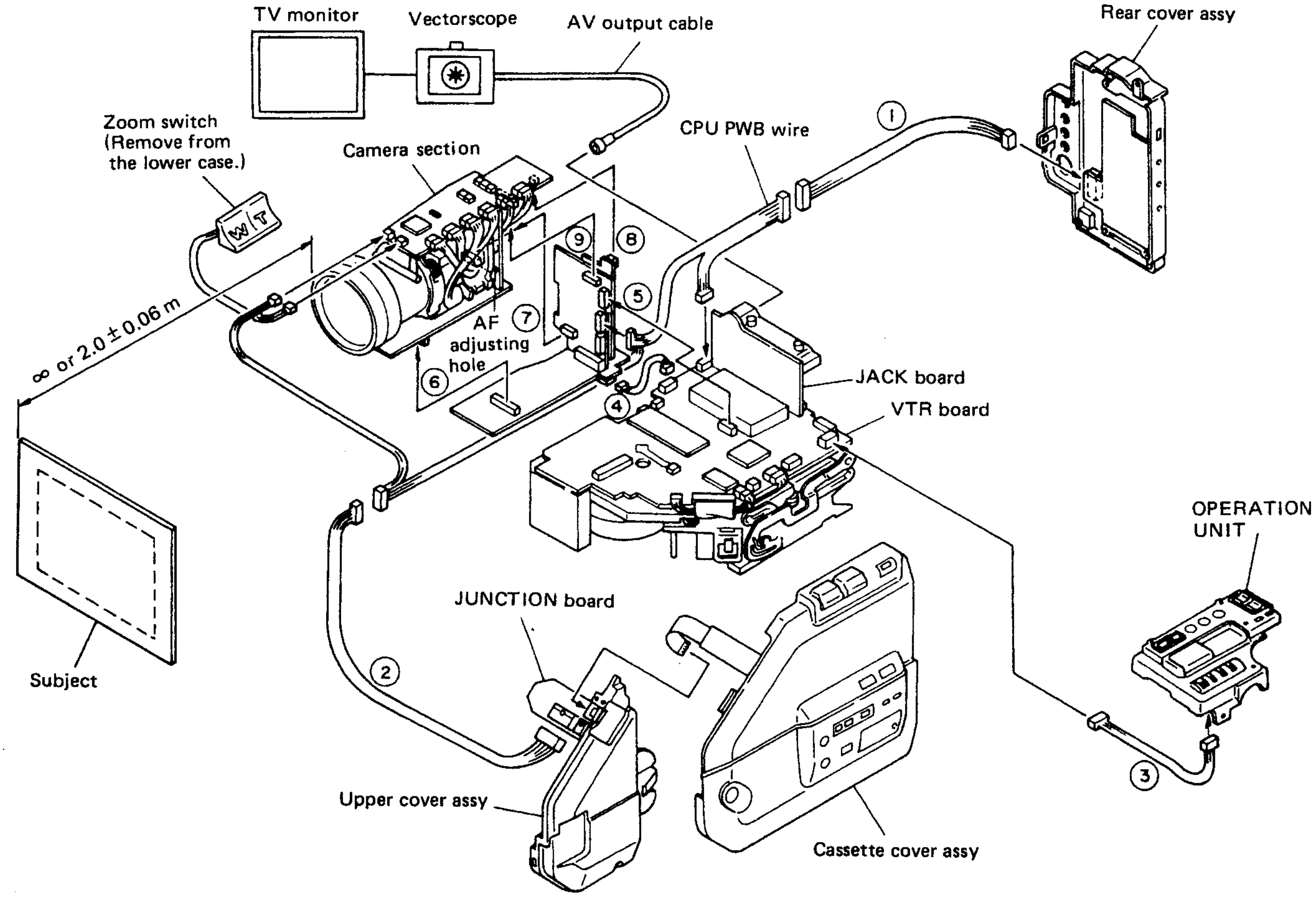

TV monitor
Vectorscope
AV output cable
Rear cover assy
Zoom switch (Remove from the lower case.)
Camera section
CPU PWB wire
①
⑨
⑧
⑤
AF adjusting hole
⑦
⑥
④
∞ or 2.0 ± 0.06 m
JACK board
VTR board
OPERATION UNIT
Subject
JUNCTION board
②
Upper cover assy
Cassette cover assy
③

Fig. 3-4-1 Connection for auto focus adjustment

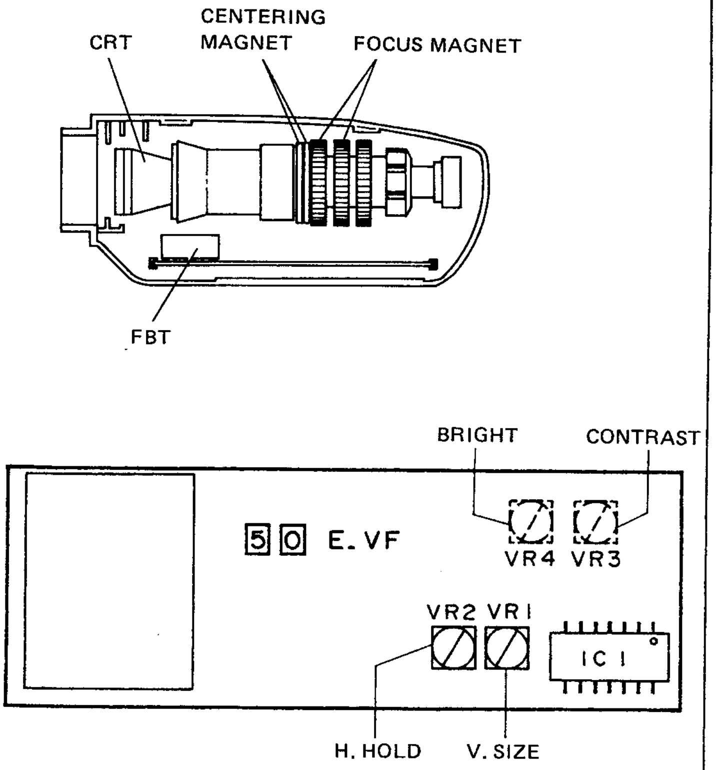
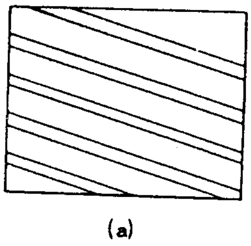
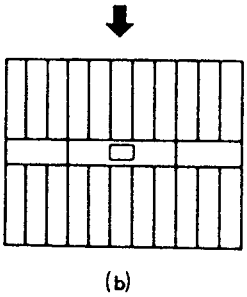
3.4.2 Adjustment

Note: *Unless otherwise specified, measurement points and adjustments are located on the* $\boxed{1}$ $\boxed{5}$ *AF board.*

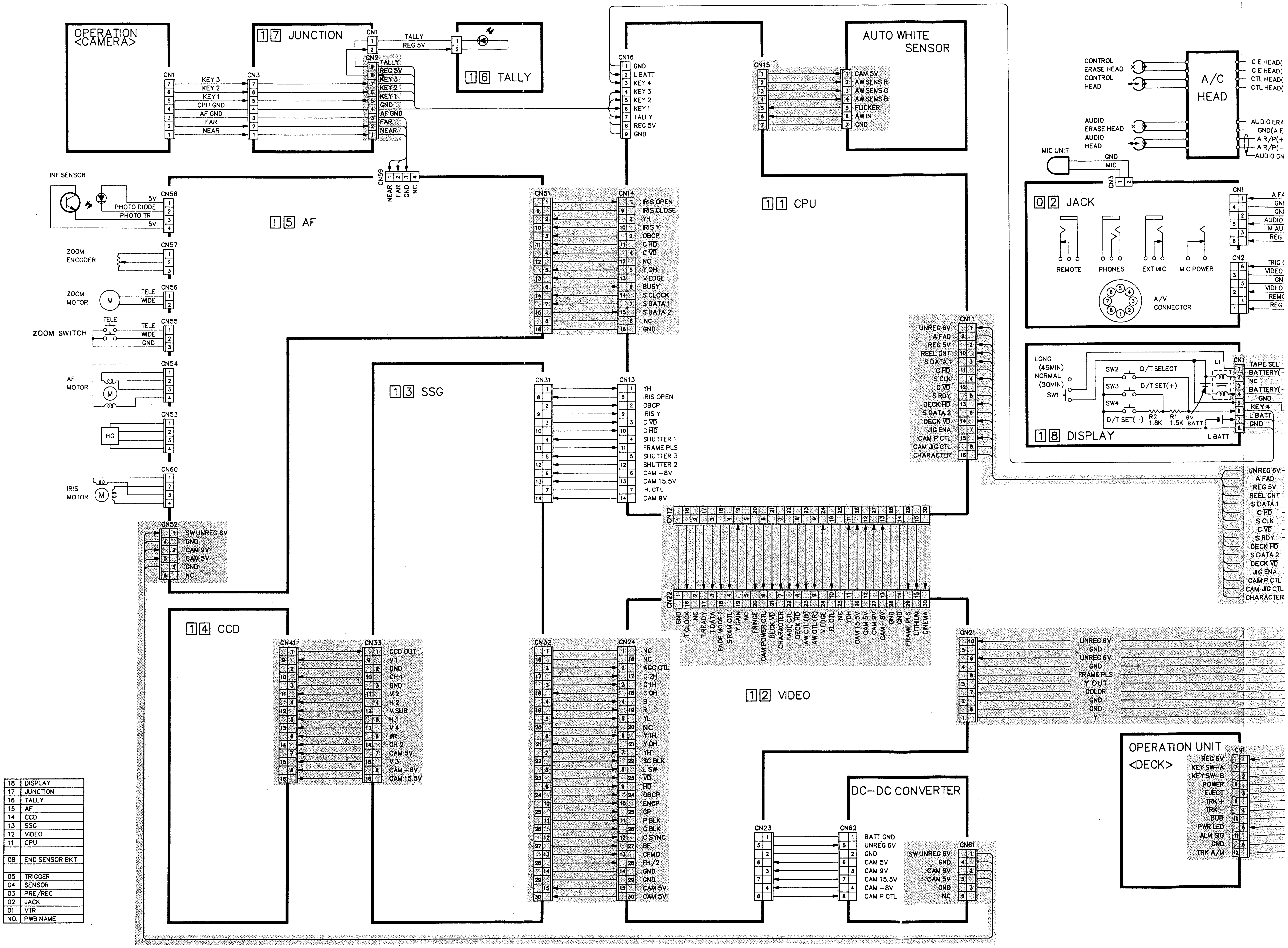
No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	Confirmation	• EE	• Subject at a distance of 50 m or more	• CN58 pin 3 (PHOTO TR IN)		1) Turn off the power and shortcircuit pin 45 of IC3 to GND. 2) Turn on the power and shoot a subject in a distance of 50 m or more in the Rehearsal mode. 3) Confirm that voltage at pin 3 of CN58 is 2.22 ± 0.05 V. 4) Shoot a subject in a distance between 2 and 3 m by zooming from the TELE to WIDE positions and vice versa a few times in order to confirm that the picture is nearly in focus in every zooming position.
2A	Auto focus	• EE	• Subject at a distance of 50 m or more • ND filter(s) • ZOOM SW: TELE end • Focus: Manual	• CN58 pin 3 (PHOTO TR IN)	• Infinite sensor	1) Turn off the power and shortcircuit pin 45 of IC3 to GND. 2) Turn on the power and shoot a subject in a distance of 50 m or more in the Rehearsal mode. 3) Attach ND filter(s) to the lens to open the iris fully. 4) Set the FOCUS button to MANUAL. 5) Set the ZOOM switch to the TELE end. 6) By operating the manual focus buttons (+ and –) to bring the subject into focus on the TV monitor. 7) Adjust the setscrew of the infinity sensor so that voltage at pin 3 of CN58 is 2.22 ± 0.05 V.
2B	Easy auto focusing	• EE	• Subject at a distance of 2.0 ± 0.06 m • ND filter(s) • ZOOM SW: TELE end • Focus: Manual	• CN58 pin 3 (PHOTO TR IN)	• Infinite sensor	1) Turn off the power and shortcircuit pin 45 of IC3 to GND. 2) Turn on the power and shoot a subject in a distance of 2.0 m in the Rehearsal mode. 3) Attach ND filters to the lens to open the iris fully. 4) Set the FOCUS button to MANUAL. 5) Set the ZOOM switch to the TELE end. 6) By operating the manual focus buttons (+ and –) to bring the subject into tocus on the TV monitor. 7) Press the MANUAL FOCUS button (+) 30 times. 8) Adjust the setscrew of the infinity sensor so that voltage at pin 3 of CN58 is 2.22 ± 0.05 V.

3.5 ELECTRONIC VIEWFINDER

Note: *Be most careful of high voltage at the anode of CRT, HV module, etc.*

No.	Item		Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	Horizontal sync.  CRT CENTERING MAGNET FOCUS MAGNET FBT BRIGHT CONTRAST 50 E. VF VR4 VR3 VR2 VR1 IC1 H. HOLD V. SIZE **Fig. 3-5-1** Electronic viewfinder	• EE	• Gray scale	• Viewfinder	• VR2 (H. HOLD) 50 E. VF	1) Observing image in the viewfinder screen, turn VR2 fully clockwise to make the picture unstable. 2) Gradually return VR2 counterclockwise until the picture becomes stable. At that time, mark the VR's position for further reference. 3) In the same manner as the above steps 1) and 2), turn VR2 clockwise and return it to mark a point where the picture becomes stable again. 4) Finally set VR2 to the midpoint of the two markings.  (a)  (b) • It is the correct setting position of VR2 that DC level of pin 12 of IC1 is 2.5 V (in Shuttle Search).
2	Vertical scanning	• EE	• Gray scale	• Viewfinder	• VR1 (V. SIZE) 50 E. VF	1) Observing image in the viewfinder, adjust VR1 for normal picture amplitude.
3	Centering	• EE	• Gray scale	• Viewfinder	• Centering magnet	1) Pick up the gray scale to locate it in the center of the TV monitor screen, and adjust the centering magnet so that the picked up gray scale pattern is positioned in the center of the viewfinder.
4	Focus	• EE	• Gray scale	• Viewfinder	• Focus magnet	1) Observing image in the viewfinder, adjust the focus magnet of the deflection yoke to obtain a clear image of the center of the gray scale.
5	Brightness	• EE	• Iris: Closed (with lens cap)	• Viewfinder	• VR4 (BRIGHT) 50 E. VF	1) Close the iris with the lens cap and adjust VR4 so that the CRT raster of the viewfinder is just barely visible.
6	Contrast	• EE	• Gray scale	• Viewfinder	• VR3 (CONT) 50 E. VF	1) Observing image in the viewfinder, adjust VR3 so that gradation of the gray scale becomes the best.

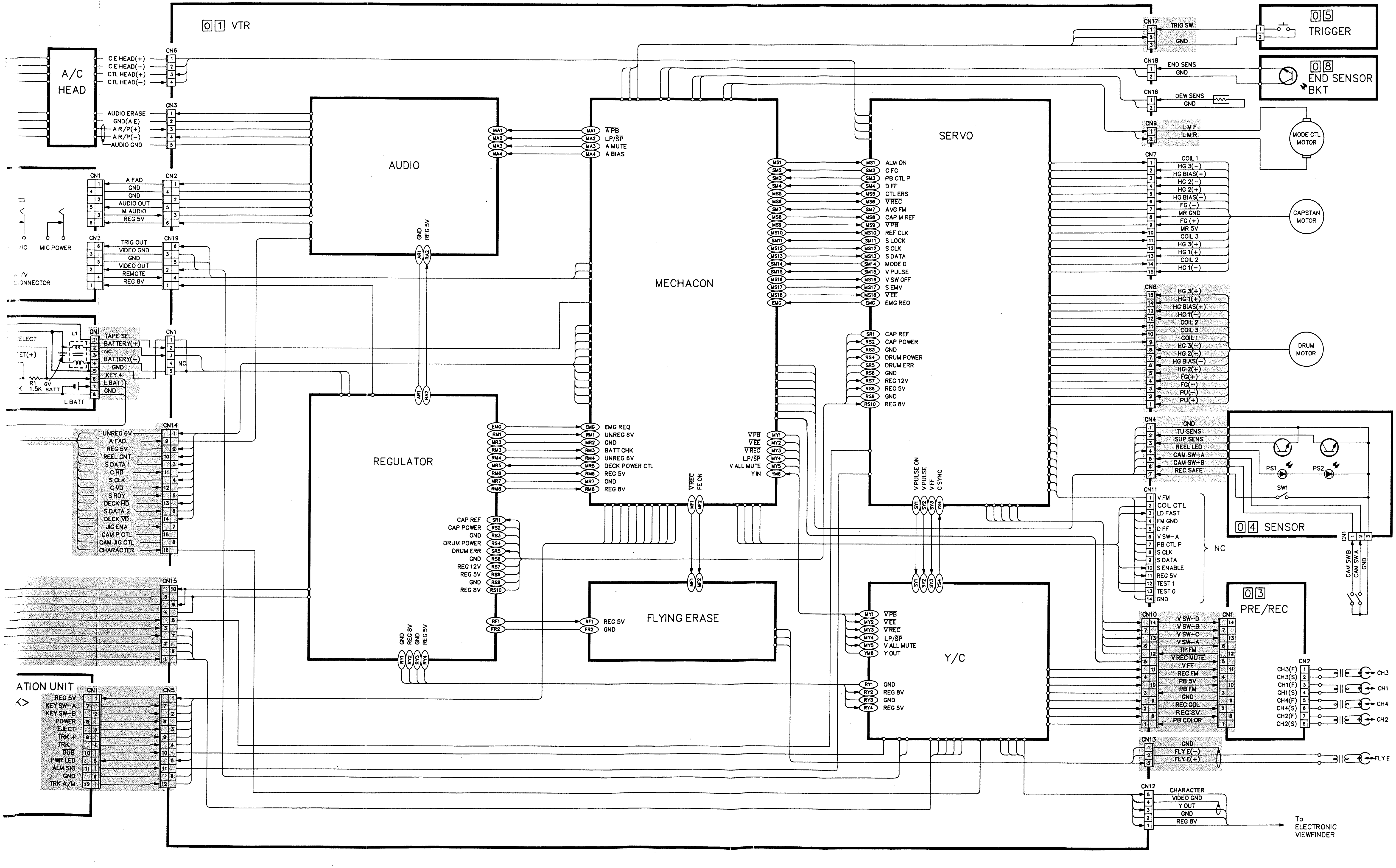
OVERALL WIRI


OPERATION <CAMERA>
CN1
KEY 3
KEY 2
KEY 1
CPU GND
AF GND
FAR
NEAR
17 JUNCTION
CN3
CN1
CN2
TALLY
REG 5V
KEY 3
KEY 2
KEY 1
GND
AF GND
FAR
NEAR
16 TALLY
CN59
NEAR
FAR
GND
NC
INF SENSOR
CN58
5V
PHOTO DIODE
PHOTO TR
5V
ZOOM ENCODER
CN57
ZOOM MOTOR
CN56
TELE
WIDE
ZOOM SWITCH
CN55
TELE
WIDE
GND
AF MOTOR
CN54
CN53
HG
IRIS MOTOR
CN60
CN52
SW UNREG 6V
GND
CAM 9V
CAM 5V
GND
NC
15 AF
CN51
CN14
IRIS OPEN
IRIS CLOSE
YH
IRIS Y
OBCP
C HD
C VD
NC
Y OH
V EDGE
BUSY
S CLOCK
S DATA 1
S DATA 2
NC
GND
CN16
GND
L BATT
KEY 4
KEY 3
KEY 2
KEY 1
TALLY
REG 5V
GND
CN15
AUTO WHITE SENSOR
CAM 5V
AW SENS R
AW SENS G
AW SENS B
FLICKER
AW IN
GND
11 CPU
CN11
UNREG 6V
A FAD
REG 5V
REEL CNT
S DATA 1
C HD
S CLK
C VD
S RDY
DECK HD
S DATA 2
DECK VD
JIG ENA
CAM P CTL
CAM JIG CTL
CHARACTER
13 SSG
CN31
CN13
YH
IRIS OPEN
OBCP
IRIS Y
C VD
C HD
SHUTTER 1
FRAME PLS
SHUTTER 3
SHUTTER 2
CAM −8V
CAM 15.5V
H. CTL
CAM 9V
CN12
CN22
GND
T CLOCK
NC
T READY
T DATA
FADE MODE 2
S RAM CTL
Y GAIN
NC
FRINGE
CAM POWER CTL
DECK VD
CHARACTER
FADE CTL
DECK HD
AW CTL (B)
AW CTL (R)
V EDGE
FL CTL
NC
YOH
CAM 15.5V
CAM 5V
CAM 9V
CAM −8V
GND
GND
FRAME PLS
LITHIUM
CINEMA
14 CCD
CN41
CN33
CCD OUT
V 1
GND
CH 1
GND
V 2
H 2
V SUB
H 1
V 4
øR
CH 2
CAM 5V
V 3
CAM −8V
CAM 15.5V
CN32
CN24
NC
NC
AGC CTL
C 2H
C 1H
C OH
B
R
YL
NC
Y 1H
Y OH
YH
SC BLK
L SW
VD
HD
OBCP
ENCP
CP
P BLK
C BLK
C SYNC
BF
CFMO
FH/2
GND
GND
CAM 5V
CAM 5V
12 VIDEO
CN21
UNREG 6V
GND
UNREG 6V
GND
FRAME PLS
Y OUT
COLOR
GND
GND
Y
DC−DC CONVERTER
CN23
CN62
BATT GND
UNREG 6V
GND
CAM 5V
CAM 9V
CAM 15.5V
CAM −8V
CAM P CTL
CN61
SW UNREG 6V
GND
CAM 9V
CAM 5V
GND
NC
CONTROL ERASE HEAD
CONTROL HEAD
AUDIO ERASE HEAD
AUDIO HEAD
A/C HEAD
C E HEAD(
C E HEAD(
CTL HEAD(
CTL HEAD(
AUDIO ERA
GND(A E
A R/P(+
A R/P(−
AUDIO GN
MIC UNIT
GND
MIC
CN3
02 JACK
REMOTE
PHONES
EXT MIC
MIC POWER
A/V CONNECTOR
CN1
A FA
GN
GN
AUDIO
M AU
REG
CN2
TRIG
VIDEO
GN
VIDEO
REMO
REG
LONG (45MIN)
NORMAL (30MIN)
SW1
SW2
D/T SELECT
SW3
D/T SET(+)
SW4
D/T SET(−)
R2 1.8K
R1 1.5K
6V BATT
L1
L BATT
18 DISPLAY
CN1
TAPE SEL
BATTERY(+
NC
BATTERY(−
GND
KEY 4
L BATT
GND
UNREG 6V
A FAD
REG 5V
REEL CNT
S DATA 1
C HD
S CLK
C VD
S RDY
DECK HD
S DATA 2
DECK VD
JIG ENA
CAM P CTL
CAM JIG CTL
CHARACTER
OPERATION UNIT <DECK>
CN1
REG 5V
KEY SW−A
KEY SW−B
POWER
EJECT
TRK +
TRK −
DUB
PWR LED
ALM SIG
GND
TRK A/M

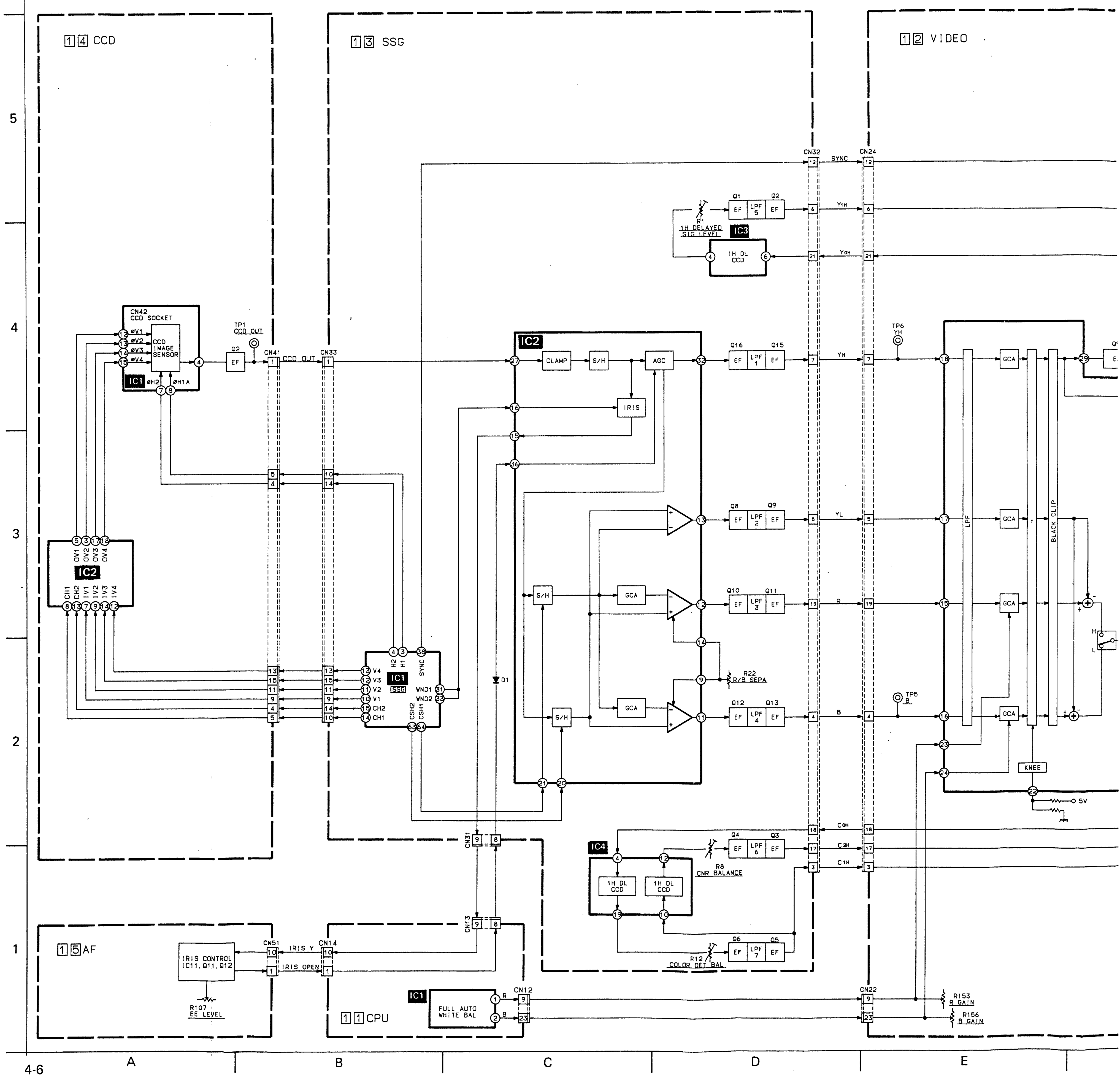
18	DISPLAY
17	JUNCTION
16	TALLY
15	AF
14	CCD
13	SSG
12	VIDEO
11	CPU
08	END SENSOR BKT
05	TRIGGER
04	SENSOR
03	PRE/REC
02	JACK
01	VTR
NO.	PWB NAME

SECTION 4
ERALL WIRING AND BLOCK DIAGRAMS

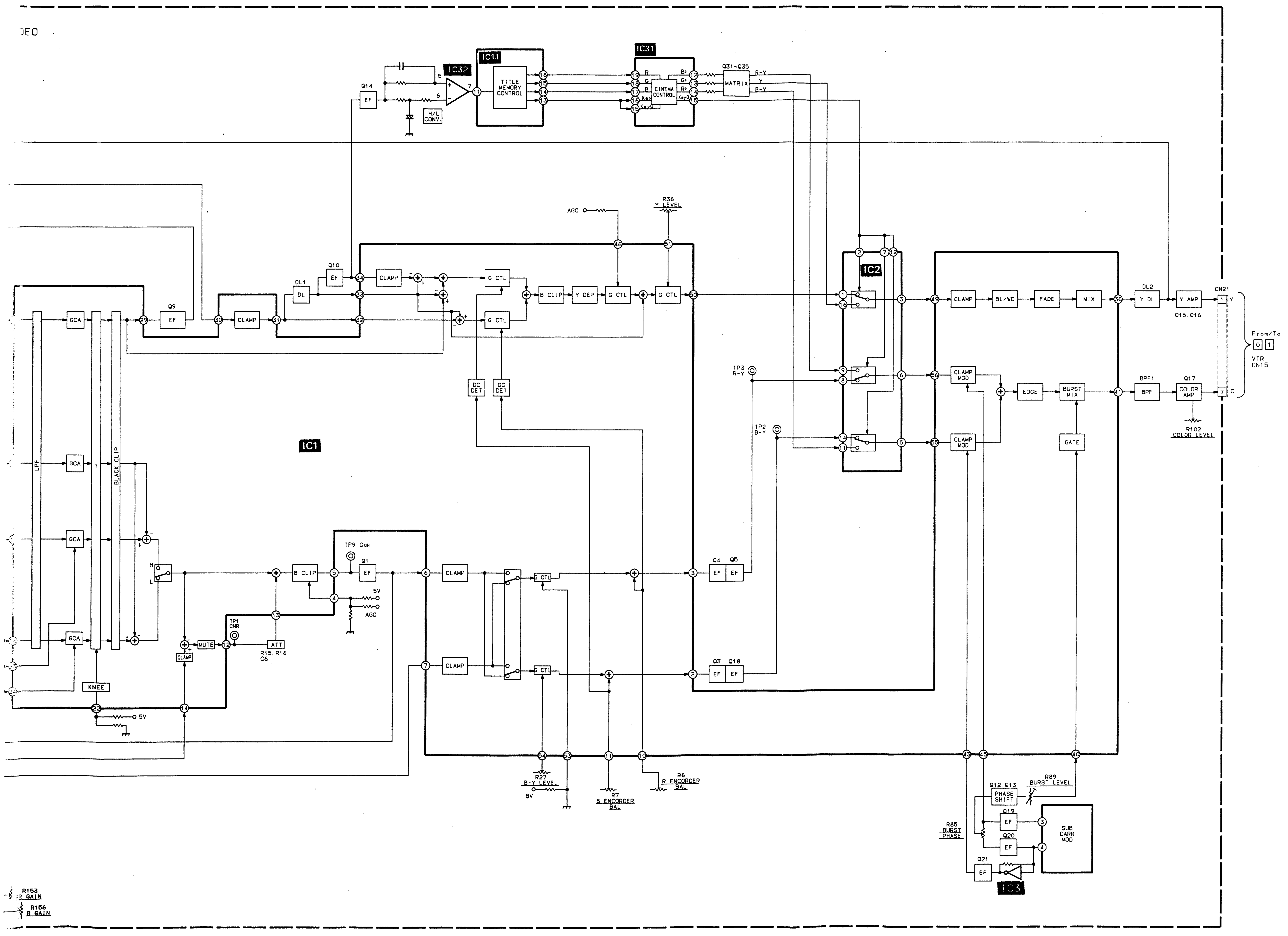
Patchcords
Patchcords are available for blue shaded portions of the overall wiring.


01 VTR
A/C HEAD
C E HEAD(+)
C E HEAD(−)
CTL HEAD(+)
CTL HEAD(−)
AUDIO ERASE
GND(A E)
A R/P(+)
A R/P(−)
AUDIO GND
A FAD
GND
AUDIO OUT
M AUDIO
REG 5V
MIC
MIC POWER
TRIG OUT
VIDEO GND
VIDEO OUT
REMOTE
REG 8V
A/V CONNECTOR
TAPE SEL
BATTERY(+)
NC
BATTERY(−)
KEY 4
L BATT
L BATT
AUDIO
MECHACON
SERVO
REGULATOR
FLYING ERASE
Y/C
A PB
LP/SP
A MUTE
A BIAS
ALM ON
C FG
PB CTL P
D FF
CTL ERS
V REC
AVG FM
CAP M REF
V PB
REF CLK
S LOCK
S CLK
S DATA
MODE D
V PULSE
V SW OFF
S EMV
V EE
EMG REQ
CAP REF
CAP POWER
DRUM POWER
DRUM ERR
REG 12V
EMG REQ
UNREG 6V
BATT CHK
DECK POWER CTL
V ALL MUTE
Y IN
Y OUT
V REC
FE ON
V PULSE ON
V PULSE
V FF
C SYNC
UNREG 6V
REEL CNT
S DATA 1
C HD
C VD
S RDY
DECK HD
S DATA 2
DECK VD
JIG ENA
CAM P CTL
CAM JIG CTL
CHARACTER
ATION UNIT
KEY SW-A
KEY SW-B
POWER
EJECT
TRK +
TRK −
DUB
PWR LED
ALM SIG
TRK A/M
05 TRIGGER
TRIG SW
08 END SENSOR BKT
END SENS
DEW SENS
LMF
LMR
MODE CTL MOTOR
HG 3(−)
HG BIAS(+)
HG 2(−)
HG 2(+)
HG BIAS(−)
FG(−)
MR GND
FG(+)
MR 5V
COIL 3
HG 3(+)
HG 1(+)
COIL 2
HG 1(−)
CAPSTAN MOTOR
COIL 1
PU(−)
PU(+)
DRUM MOTOR
TU SENS
SUP SENS
REEL LED
CAM SW-A
CAM SW-B
REC SAFE
PS1
PS2
SW1
04 SENSOR
CAM SW B
CAM SW A
V FM
COL CTL
LD FAST
FM GND
D FF
V SW−A
PB CTL P
S CLK
S DATA
S ENABLE
REG 5V
TEST 1
TEST 0
NC
03 PRE/REC
V SW−D
V SW−B
V SW−C
V SW−A
TP FM
V REC MUTE
V FF
REC FM
PB 5V
PB FM
REC COL
REC 8V
PB COLOR
CH3(F)
CH3(S)
CH1(F)
CH1(S)
CH4(F)
CH4(S)
CH2(F)
CH2(S)
CH3
CH1
CH4
CH2
FLY E(−)
FLY E(+)
FLY E
VIDEO GND
To ELECTRONIC VIEWFINDER

4.2 CAMERA BLOCK DIAGRAM

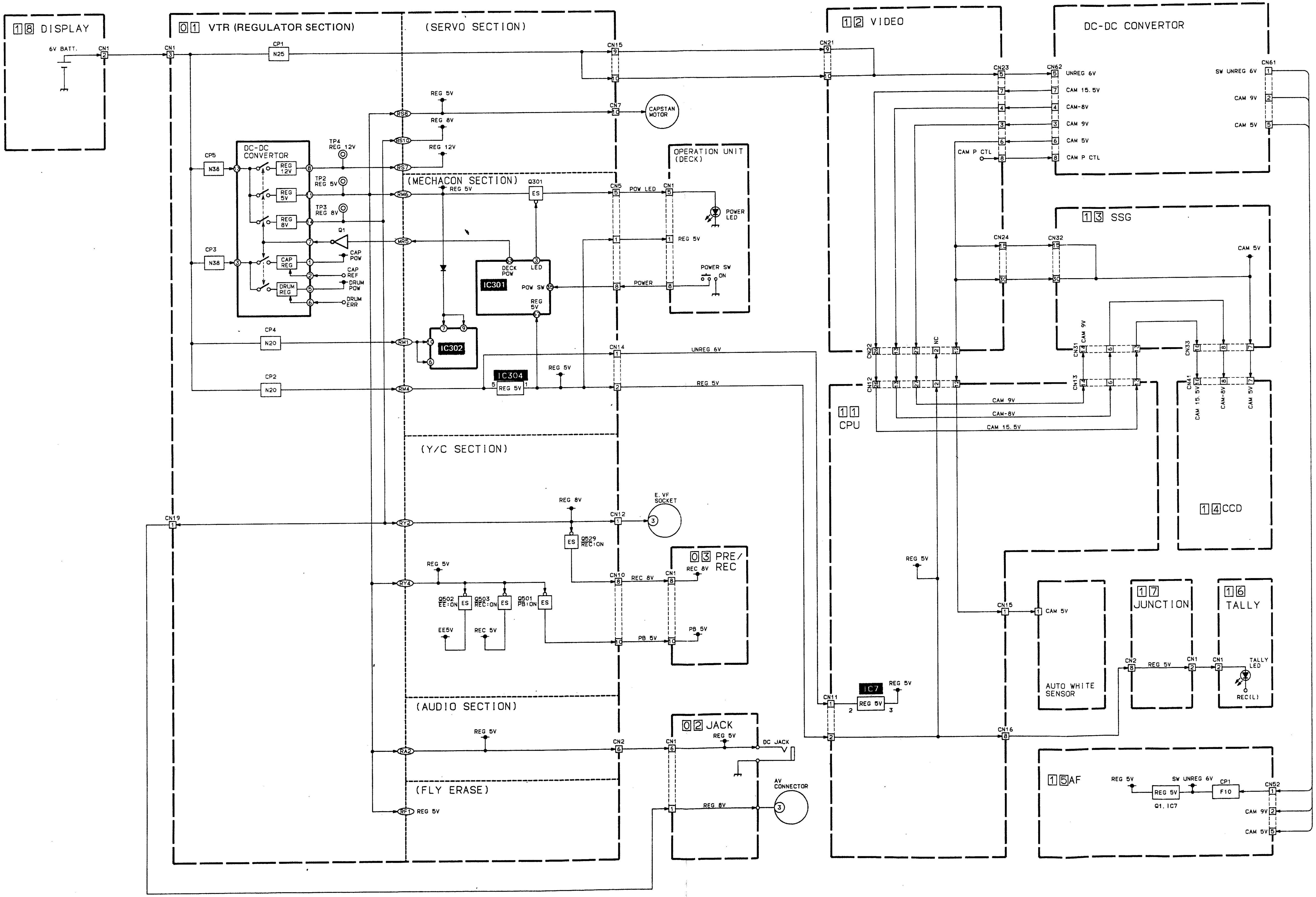


6
5
4
3
2
1
14 CCD
13 SSG
12 VIDEO
15 AF
11 CPU
CN42 CCD SOCKET
øV1
øV2
øV3
øV4
CCD IMAGE SENSOR
IC1
øH2
øH1A
TP1 CCD OUT
Q2
EF
CN41
CCD OUT
CN33
IC2
OV1 OV2 OV3 OV4
CH1 CH2 IV1 IV2 IV3 IV4
IC1
SSG
V4 V3 V2 V1 CH2 CH1
H2 H1 SYNC
WND1 WND2
CSH2 CSH1
CLAMP
S/H
AGC
IRIS
GCA
D1
R22 R/B SEPA
Q1 EF LPF 5 EF Q2
R1 1H DELAYED SIG LEVEL
IC3
1H DL CCD
Q16 EF LPF 1 EF Q15
Q8 EF LPF 2 EF Q9
Q10 EF LPF 3 EF Q11
Q12 EF LPF 4 EF Q13
Q4 EF LPF 6 EF Q3
Q6 EF LPF 7 EF Q5
IC4
1H DL CCD
R8 CNR BALANCE
R12 COLOR DET BAL
CN32
CN24
SYNC
YH
YOH
YL
R
B
COH
C2H
C1H
TP6 YH
TP5 B
LPF
GCA
BLACK CLIP
KNEE
5V
H
L
CN31
CN13
CN51
CN14
IRIS Y
IRIS OPEN
IRIS CONTROL IC11, Q11, Q12
R107 EE LEVEL
IC1
FULL AUTO WHITE BAL
CN12
CN22
R153 R GAIN
R156 B GAIN
A
B
C
D
E



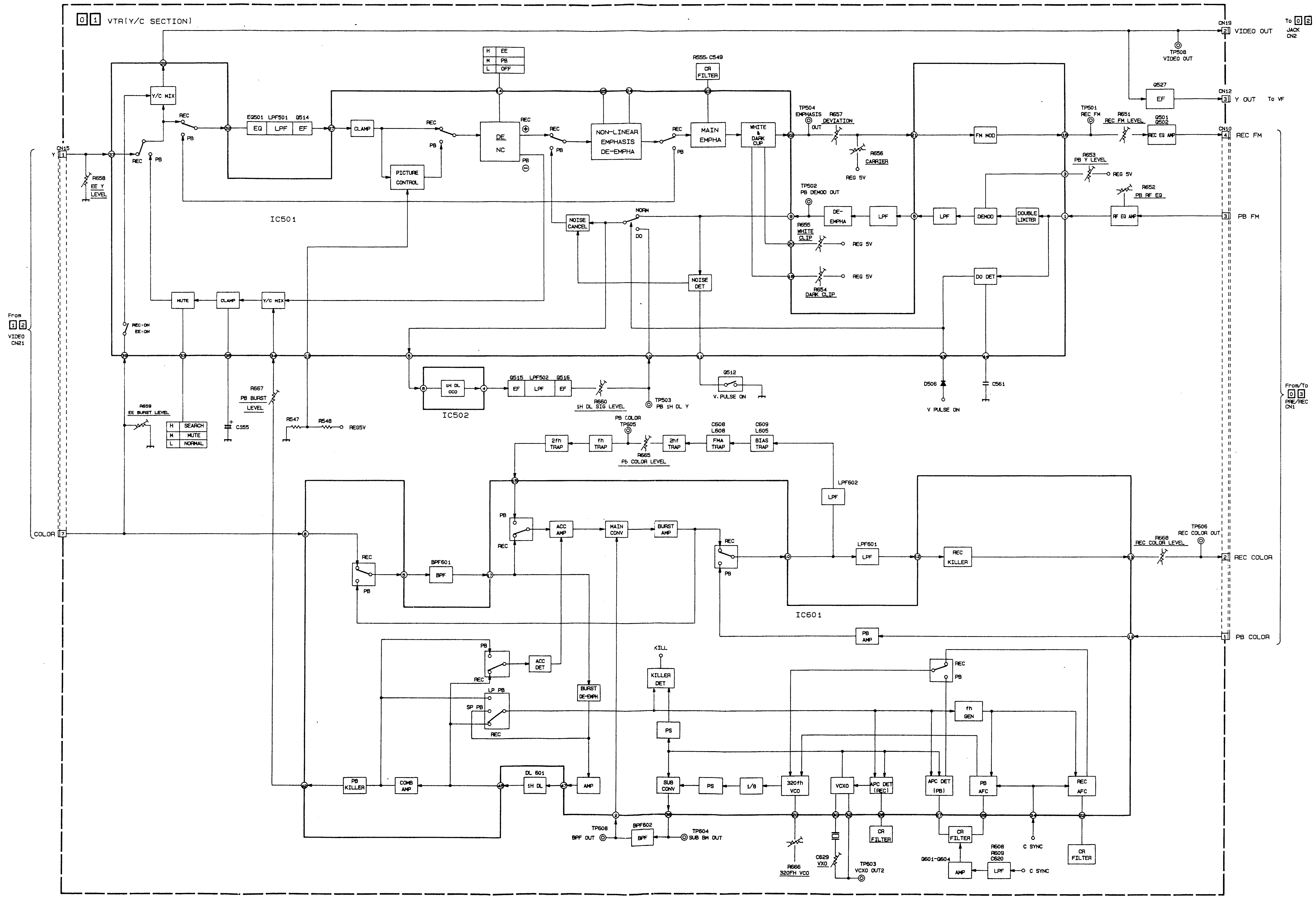
DEO
IC32
IC11
TITLE MEMORY CONTROL
IC31
CINEMA CONTROL
Q31~Q35
MATRIX
R-Y
Y
B-Y
Q14
EF
H/L CONV.
AGC
R36 Y LEVEL
DL1
DL
Q10
EF
CLAMP
G CTL
B CLIP
Y DEP
Q9
LPF
GCA
BLACK CLIP
KNEE
DC DET
IC1
IC2
TP3 R-Y
TP2 B-Y
TP9 CoH
Q1
TP1 CNR
MUTE
ATT
R15, R16 C6
5V
Q4
Q5
Q3
Q18
R27 B-Y LEVEL
R7 B ENCORDER BAL
R6 R ENCORDER BAL
BL/WC
FADE
MIX
CLAMP MOD
EDGE
BURST MIX
GATE
DL2
Y DL
Y AMP
Q15, Q16
BPF1
BPF
Q17
COLOR AMP
R102 COLOR LEVEL
CN21
From/To
0 1
VTR CN15
Q12, Q13
PHASE SHIFT
R89 BURST LEVEL
R85 BURST PHASE
Q19
Q20
Q21
SUB CARR MOD
IC3
R153 R GAIN
R156 B GAIN

4.3 POWER SYSTEM BLOCK DIAGRAM



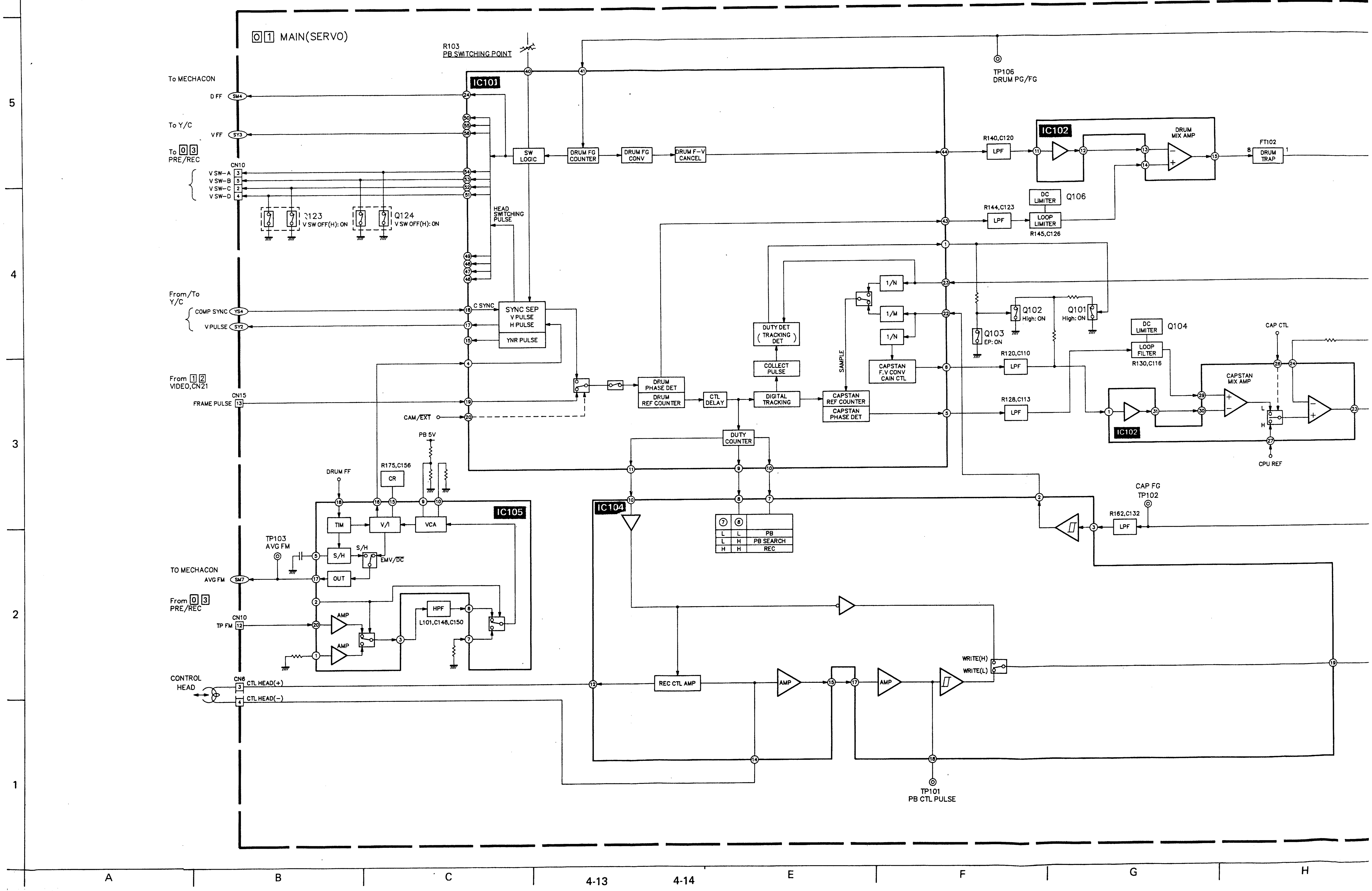
18 DISPLAY
6V BATT.
CN1
01 VTR (REGULATOR SECTION)
(SERVO SECTION)
(MECHACON SECTION)
(Y/C SECTION)
(AUDIO SECTION)
(FLY ERASE)
CP1 N25
CP5 N38
CP3 N38
CP4 N20
CP2 N20
DC-DC CONVERTOR
REG 12V
REG 5V
REG 8V
CAP REG
DRUM REG
Q1
CAP POW
CAP REF
DRUM POW
DRUM ERR
TP4 REG 12V
TP2 REG 5V
TP3 REG 8V
RS8
RS10
RS7
RM6
MR5
RM1
RM4
RY2
RY4
RA2
RF1
REG 5V
REG 8V
REG 12V
Q301
ES
DECK POW
LED
IC301
POW SW
IC302
IC304
REG 5V
CN15
CN7
CAPSTAN MOTOR
CN5
POW LED
POWER
CN14
UNREG 6V
OPERATION UNIT (DECK)
POWER LED
POWER SW
ON
CN19
CN12
E.VF SOCKET
Q529 REC:ON
Q502 EE:ON
Q503 REC:ON
Q501 PB:ON
EE5V
REC 5V
CN10
REC 8V
PB 5V
03 PRE/REC
CN2
02 JACK
DC JACK
AV CONNECTOR
12 VIDEO
CN21
CN23
CAM P CTL
CN24
CN22
NC
CN12
DC-DC CONVERTOR
CN62
UNREG 6V
CAM 15.5V
CAM-8V
CAM 9V
CAM 5V
CAM P CTL
CN61
SW UNREG 6V
13 SSG
CN32
CN31
CN13
CN33
CN41
14 CCD
11 CPU
CAM 9V
CAM-8V
CAM 15.5V
IC7
CN11
CN16
AUTO WHITE SENSOR
17 JUNCTION
16 TALLY
TALLY LED
REC(L)
15 AF
SW UNREG 6V
CP1 F10
Q1, IC7
CN52

4.4 Y/C BLOCK DIAGRAM

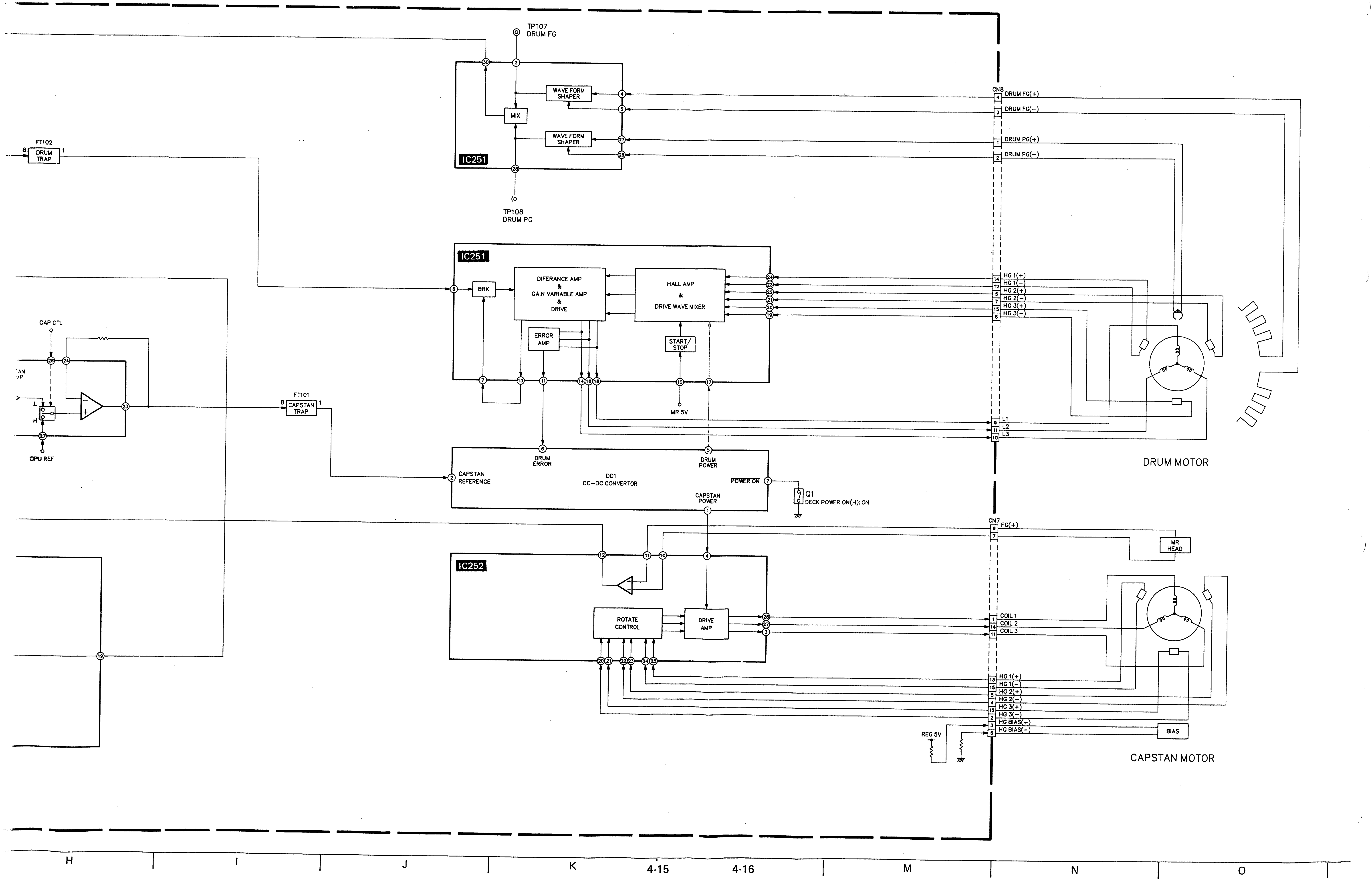

0 1 VTR(Y/C SECTION)
From 1 2 VIDEO CN21
CN15
Y 1
COLOR 7
R658 EE Y LEVEL
Y/C MIX
REC
PB
EQ501 LPF501 Q514
EQ
LPF
EF
CLAMP
PICTURE CONTROL
H EE
M PB
L OFF
DE NC
REC ⊕
PB ⊖
NON-LINEAR EMPHASIS DE-EMPHA
R555, C549
CR FILTER
MAIN EMPHA
WHITE & DARK CLIP
TP504 EMPHASIS OUT
R657 DEVIATION
R656 CARRIER
REG 5V
FM MOD
TP501 REC FM
R651 REC FM LEVEL
Q501 Q502
REC EQ AMP
CN19
2 VIDEO OUT
To 0 2 JACK CN2
TP508 VIDEO OUT
Q527
EF
CN12
3 Y OUT
To VF
CN10
4 REC FM
R653 PB Y LEVEL
R652 PB RF EQ
RF EQ AMP
3 PB FM
TP502 PB DEMOD OUT
DE-EMPHA
LPF
DEMOD
DOUBLE LIMITER
R655 WHITE CLIP
R654 DARK CLIP
DO DET
NORM
DO
NOISE CANCEL
NOISE DET
IC501
MUTE
CLAMP
Y/C MIX
REC: ON EE: ON
IC502
1H DL CCD
Q515 LPF502 Q516
EF
LPF
EF
R660 1H DL SIG LEVEL
TP503 PB 1H DL Y
Q512
V. PULSE ON
D506
V PULSE ON
C561
From/To 0 3 PRE/REC CN1
R659 EE BURST LEVEL
H SEARCH
M MUTE
L NORMAL
C555
R667 PB BURST LEVEL
R547
R548
REG5V
PB COLOR TP605
2fh TRAP
fh TRAP
R665 PB COLOR LEVEL
2hf TRAP
C608 L608
FMA TRAP
C609 L605
BIAS TRAP
LPF602
LPF
BPF601
BPF
ACC AMP
MAIN CONV
BURST AMP
LPF601
LPF
REC KILLER
IC601
R668 REC COLOR LEVEL
TP606 REC COLOR OUT
2 REC COLOR
PB AMP
1 PB COLOR
ACC DET
LP PB
SP PB
BURST DE-EMPH
KILL
KILLER DET
PS
fh GEN
PB KILLER
COMB AMP
DL 601
1H DL
AMP
SUB CONV
PS
1/8
320fh VCO
VCXO
APC DET (REC)
APC DET (PB)
PB AFC
REC AFC
TP608 BPF OUT
BPF602
BPF
TP604 SUB BM OUT
R666 320FH VCO
C629 VXO
TP603 VCXO OUT2
CR FILTER
CR FILTER
Q601-Q604
AMP
R608 R609 C620
LPF
C SYNC
C SYNC
CR FILTER

6

4.5 SERVO BLOCK DIAGRAM



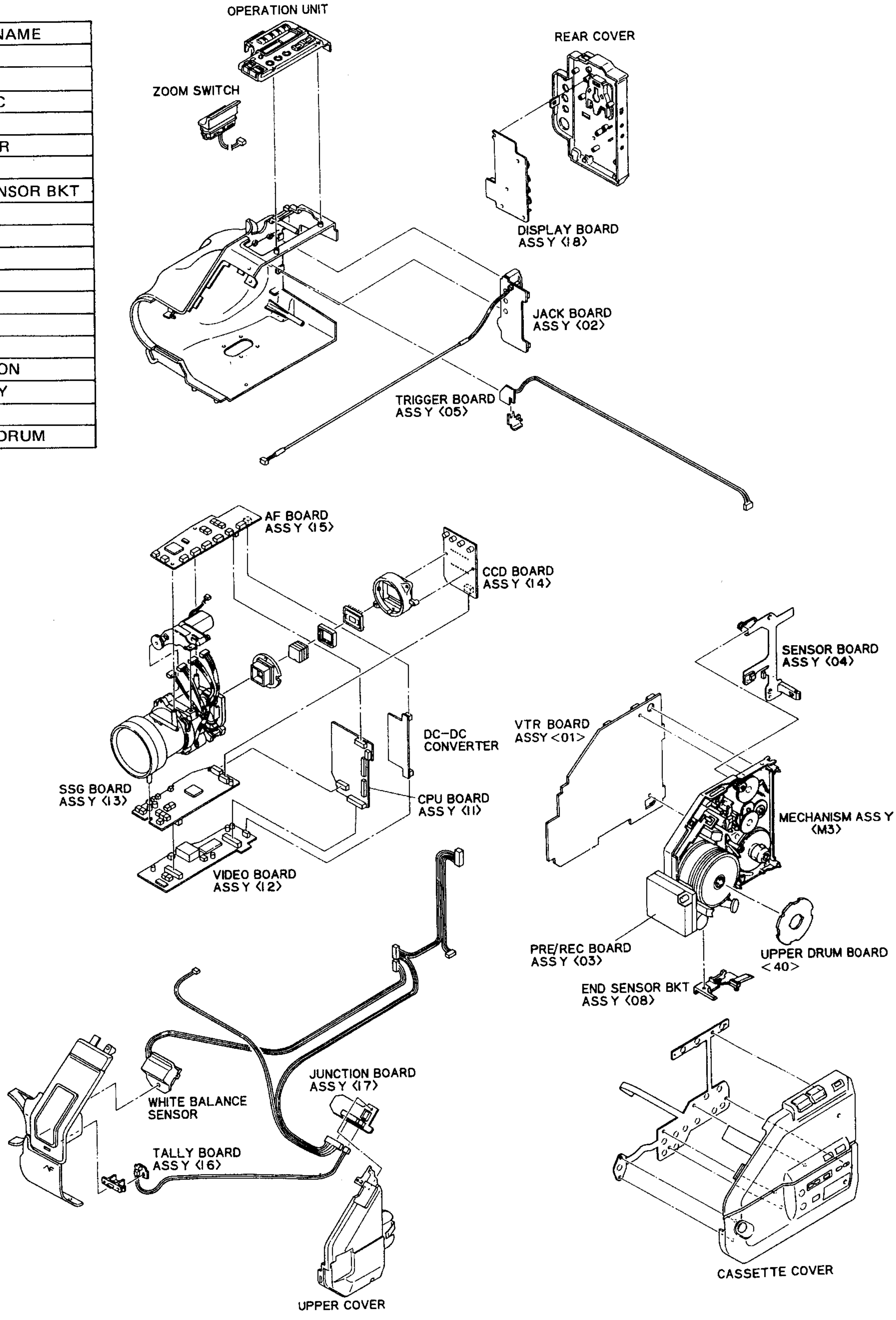
0 1 MAIN(SERVO)
R103
PB SWITCHING POINT
IC101
TP106
DRUM PG/FG
To MECHACON
D FF
SM4
To Y/C
V FF
SY3
To 0 3
PRE/REC
CN10
V SW–A 3
V SW–B 5
V SW–C 2
V SW–D 4
Q123
V SW OFF(H): ON
Q124
V SW OFF(H): ON
SW LOGIC
DRUM FG COUNTER
DRUM FG CONV
DRUM F–V CANCEL
HEAD SWITCHING PULSE
R140,C120
LPF
IC102
DRUM MIX AMP
FT102
DRUM TRAP
DC LIMITER
Q106
R144,C123
LPF
LOOP LIMITER
R145,C126
From/To Y/C
COMP SYNC
YS4
V PULSE
SY2
C SYNC
SYNC SEP
V PULSE
H PULSE
YNR PULSE
From 1 2 VIDEO,CN21
CN15
FRAME PULSE 13
CAM/EXT
DRUM PHASE DET
DRUM REF COUNTER
CTL DELAY
DIGITAL TRACKING
COLLECT PULSE
DUTY DET (TRACKING DET)
SAMPLE
CAPSTAN REF COUNTER
CAPSTAN PHASE DET
1/N
1/M
1/N
CAPSTAN F.V CONV GAIN CTL
Q102 High: ON
Q101 High: ON
Q103 EP: ON
R120,C110
LPF
R128,C113
LPF
DC LIMITER
Q104
LOOP FILTER
R130,C116
CAP CTL
CAPSTAN MIX AMP
IC102
L
H
CPU REF
DUTY COUNTER
PB 5V
R175,C156
CR
DRUM FF
IC105
TIM
V/I
VCA
TP103
AVG FM
S/H
S/H
EMV/DC
OUT
TO MECHACON
AVG FM
SM7
From 0 3 PRE/REC
CN10
TP FM 12
AMP
AMP
HPF
L101,C148,C150
IC104
⑦ ⑧
L L PB
L H PB SEARCH
H H REC
CAP FG
TP102
R162,C132
LPF
CONTROL HEAD
CN6
CTL HEAD(+) 3
CTL HEAD(–) 4
REC CTL AMP
AMP
AMP
WRITE(H)
WRITE(L)
TP101
PB CTL PULSE
5
4
3
2
1
A
B
C
E
F
G
H


TP107
DRUM FG
WAVE FORM SHAPER
MIX
WAVE FORM SHAPER
IC251
TP108
DRUM PG
CN8
DRUM FG(+)
DRUM FG(−)
DRUM PG(+)
DRUM PG(−)
FT102
DRUM TRAP
IC251
BRK
DIFERANCE AMP & GAIN VARIABLE AMP & DRIVE
HALL AMP & DRIVE WAVE MIXER
ERROR AMP
START/ STOP
MR 5V
HG 1(+)
HG 1(−)
HG 2(+)
HG 2(−)
HG 3(+)
HG 3(−)
L1
L2
L3
CAP CTL
CPU REF
FT101
CAPSTAN TRAP
DRUM ERROR
DRUM POWER
CAPSTAN REFERENCE
DD1
DC−DC CONVERTOR
POWER ON
Q1
DECK POWER ON(H): ON
CAPSTAN POWER
DRUM MOTOR
CN7
FG(+)
MR HEAD
IC252
ROTATE CONTROL
DRIVE AMP
COIL 1
COIL 2
COIL 3
HG 1(+)
HG 1(−)
HG 2(+)
HG 2(−)
HG 3(+)
HG 3(−)
HG BIAS(+)
HG BIAS(−)
BIAS
REG 5V
CAPSTAN MOTOR
H
I
J
K
M
N
O

SECTION 5
DIAGRAMS AND CIRCUIT BOARDS

5.1 CIRCUIT BOARD LOCATIONS

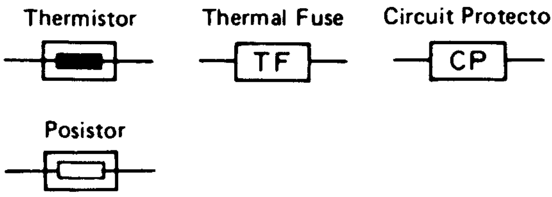
No.	PWB NAME
01	VTR
02	JACK
03	PRE/REC
04	SENSOR
05	TRIGGER
08	END SENSOR BKT
11	CPU
12	VIDEO
13	SSG
14	CCD
15	AF
16	TALLY
17	JUNCTION
18	DISPLAY
40	UPPER DRUM

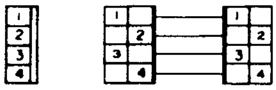

OPERATION UNIT
REAR COVER
ZOOM SWITCH
DISPLAY BOARD ASSY ‹18›
JACK BOARD ASSY ‹02›
TRIGGER BOARD ASSY ‹05›
AF BOARD ASSY ‹15›
CCD BOARD ASSY ‹14›
SENSOR BOARD ASSY ‹04›
DC-DC CONVERTER
VTR BOARD ASSY ‹01›
SSG BOARD ASSY ‹13›
CPU BOARD ASSY ‹11›
MECHANISM ASSY ‹M3›
VIDEO BOARD ASSY ‹12›
PRE/REC BOARD ASSY ‹03›
UPPER DRUM BOARD ‹40›
END SENSOR BKT ASSY ‹08›
JUNCTION BOARD ASSY ‹17›
WHITE BALANCE SENSOR
TALLY BOARD ASSY ‹16›
UPPER COVER
CASSETTE COVER

5.2 SCHEMATIC DIAGRAM NOTES

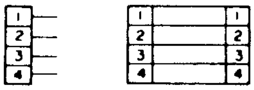
1. ▨ parts are safety related parts. When replacing them, be sure to use the specified parts.
2. Unit indications

No units: [Ω]	No units: [μF]	No units : [μH]
K: [kΩ]	P: [pF]	m: [mH]
M: [MΩ]		

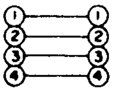

Thermistor
Thermal Fuse
TF
Circuit Protector
CP
Posistor



: Connector



: Board in connector



: Direct connection

COUNT UP : Active only at high.

$\overline{\text{COUNT DOWN}}$: Active only at low.

(VS) : Connected pattern in the board.

(MS) Abbreviations

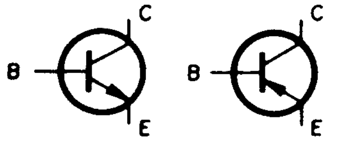
(SM)

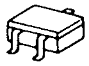
V : Video M : Mechacon

S : Servo A : Audio

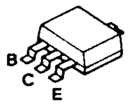
VS : Signal flow from video to servo.

3. Chip transistor

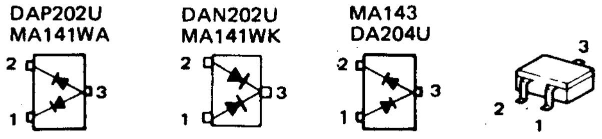




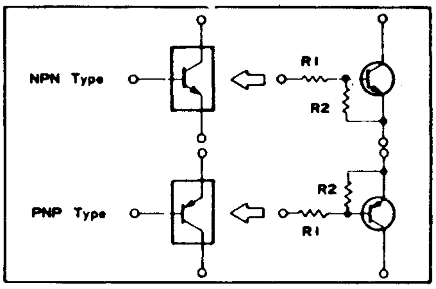
(Standard type)



4. Chip diode


DAP202U
MA141WA
2
3
1
DAN202U
MA141WK
2
3
1
MA143
DA204U
2
3
1
3
2
1

5. Digital transistor


NPN Type
R1
R2
PNP Type
R2
R1

RESISTOR VALUES

JUNCTION	Part No.	R1 (kΩ)	R2 (kΩ)
PNP	DTA124EU	22	22
NPN	DTC144EU	47	47
	DTC124EU	22	22

Note: The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

USES: INVERTER, INTERFACE, DRIVER CIRCUITS.

6. Definition of the surface and the back of circuit board diagrams

Front : Side on which discrete parts are assembled

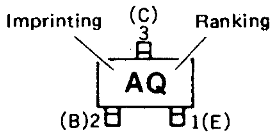
Rear : Side on which chip parts are assembled

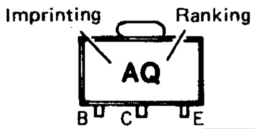
5.3 REPLACING SUBMINIATURE "CHIP" PARTS

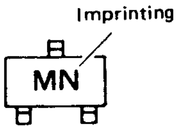
1. Some resistors, shorting jumpers (0 Ω resistance), ceramic capacitors, transistors, and diodes are chip parts. These chip parts cannot be reused after they are once removed.
2. Additional compactness is achieved by using subminiature chip parts for certain circuit elements. When replacing these parts, note the cautions outlined below.
3. Chip transistors and diodes used in this model are outlined bellow.
4. Refer to parts list for correct part numbers.

- **Chip transistor and chip diode imprinting**

Transistors				Diodes	
Type	Imprinting	Type	Imprinting	Type	Imprinting
DTA114EU	14	2SB1073(PQ)	1P, 1Q	DAN202K	N
DTA124EK	15	2SB1132(QR)	BAQB, BARB	DAN202U	N
DTA124EU	15	2SB1218(QR)	AQ, AR	DAP202K	P
DTA143ZK	E13	2SB4098(PQ)	AP, AQ	DAP202U	P
DTA144EK	16	2SB624	BV1–BV5	DA204K	K
DTA144EU	16	2SB798	DK–DM	DA204U	K
DTC124EK	25	2SC2412K(QR)	BQ, BR	FMN1	N1
DTC124EU	25	2SC3931(CD)	UC, UD	IMN10	N10
DTC124TU	05	2SC3936(BC)	KB, KC	MA141A	MA
DTC143TU	03	2SC4081	BQ–BS	MA141WA	MN
DTC144EK	26	2SC4097(QR)	CQ, CR	MA141WK	MT
DTC144EU	26	2SC4098(PQ)	AP, AQ	MA704	MIK
DTC144WK	86	2SC4116(G)	LG	RD7.5M-T2B2	7.52
2SA1037K(QR)	FQ, FR	2SC4181	L17, L18		
2SA1502	HL	2SD1819	YR–YS		
2SA1532(BC)	EB, EC	2SJ146	4D		
2SA1576	FQ–FS	UN5216	8F		
2SA1577(PQ)	HP, HQ				







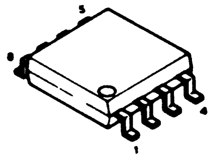
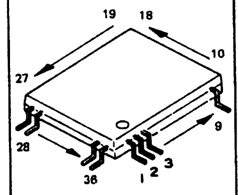
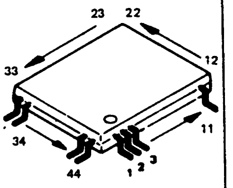
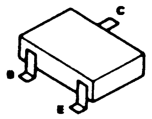
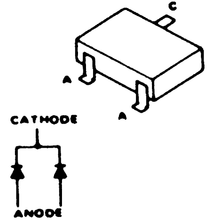
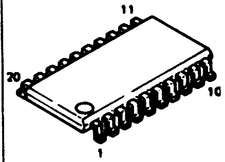
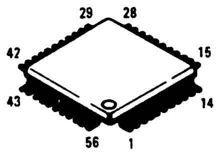
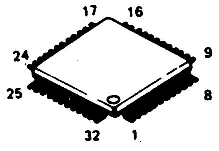
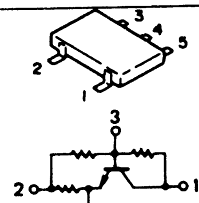
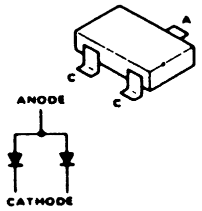
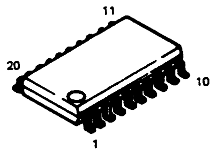
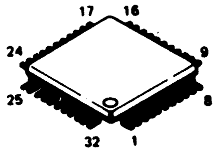
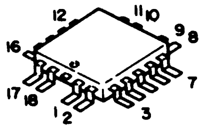
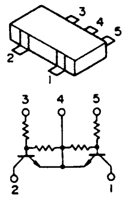
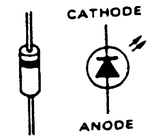
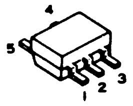
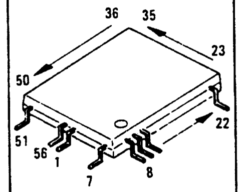
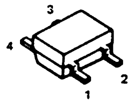
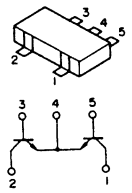
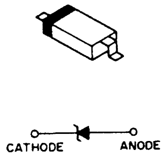
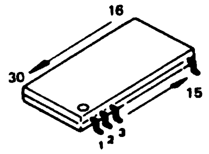
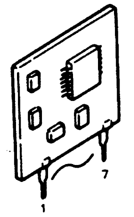
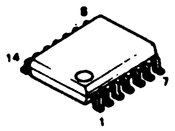
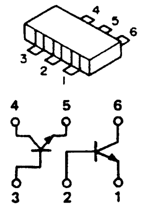
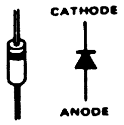
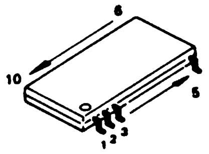
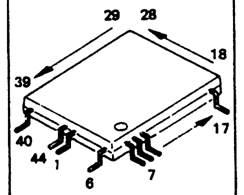
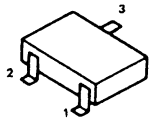
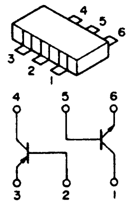
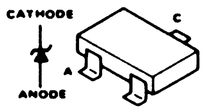
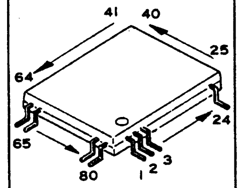
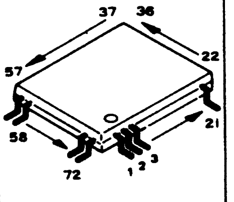
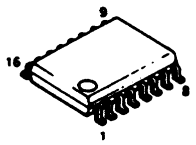
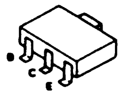
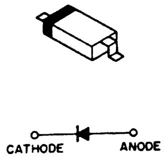
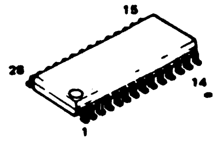
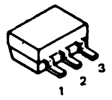
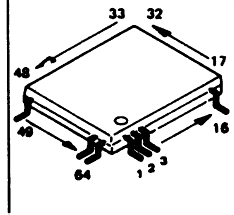
5.4 KEY TO ABBREVIATIONS

A	AC	: Alternating Current
	ACC	: Automatic Color Control
	A/CTL	: Audio/Control
	ADC	: Analog to Digital Converter
	ADD	: Adder
	ADJ	: Adjustment
	AE	: Audio Erase
	AEF	: Automatic Editing Function
	AF	: **Auto Focus**
	AFC	: Automatic Frequency Control
	AFT	: Automatic Fine Tuning
	AGC	: Automatic Gain Control
	AH	: Audio Head
	AL	: **After Loading, Allways**
	ALC	: Automatic Light Compensation Automatic Level Control
	ALM	: Alarm
	ALU	: Arithmetic Logic Unit
	AM	: Amplitude Modulation
	AMP	: Amplifier
	ANT	: Antenna
	APC	: Automatic Pedestal Control Automatic Phase Control
	APL	: Average Picture Level
	A S M	: Audio/Servo/Mechacon
	ASS'Y	: Assembly
	ATT	: Attenuator
	AUD	: Audio
	AUTO	: Automatic
	AUX	: Auxiliary
B	B	: **Base, Blue**
	BAL	: Balance
	BATT	: Battery
	BBD	: Bucket Brigade Device
	BCD	: Binary Coded Decimal
	BEG	: Beginning
	BF	: **Behind Focus**
	BFP	: Burst Flag Pulse
	BPF	: **Band Pass Filter**
	BIT	: Binary Digit
	BLK	: Black, Blanking
	BLU	: Blue
	BNC	: Bayonet Connector
	BOT	: Beginning of Tape
	BPF	: Bandpass Filter
	BRK	: Brake
	BRN	: Brown
	BRT	: Brightness
	BT	: Band Tuning
	BUFF	: Buffer
	BW or B/W	: Black and White
C	C	: **Capacitance, Collector, Color, Character**
	CA	: **Camera**
	CAL	: Calibration
	CAP	: Capstan, Capacitor
	CAR	: Carrier
	CARR	: Carrier
	CASS	: Cassette
	CC	: Cassette Compartment
	CCD	: Charge Coupled Device
	CCT	: Circuit
	CdS	: Cadmium Sulphide
	CD	: Count Down
	CE	: Chip Enable
	CF	: **Ceramic Filter, Color Frame, Correct Focus**
	CH	: Channel
	CHG	: Charge
	CHROMA	: Chrominance
	CLK	: Clock
	CLR	: Clear
	CMD	: Command
	CMOS	: Complementary Metal Oxide Semiconductor
	CNT	: Count, Counter
	COL	: Color
	COM	: Common
	COMB	: Combination Comb Filter
	COMP	: Comparator Composite Compensation
	CONN	: Connector
	CONV	: Converter
	CP	: Circuit Protector Clamp Pulse
	CPC	: Capstan Phase Control
	CPU	: Central Processing Unit
	CTC	: Crosstalk Cancel
	CTL	: Control
D	D	: Drum, Digital, Diode, Drain
	DAC	: Digital to Analog Converter
	dB	: Decibel
	DC	: Direct Current
	DD	: Direct Drive
	DEC	: Decoder
	DEMOD	: Demodulator
	DEMUX	: Demultiplexer
	DET	: Detector
	DEV	: Deviation
	DFRS	: Drum Free Running Stop
	DG	: Differential Gain
	DIF	: Differential
	DISCR	: Discriminator
	DL	: Delay Line
	DOC	: Dropout Compensator
	DOD	: Drop Out Detector
	DP	: Differential Phase
	DPC	: Drum Phase Control
	DYAC	: Dynamic Aperture Control
E	E	: Edit, Emitter
	EDP	: Electronic Data Processing
	E-E	: Electric to Electric
	EF	: Emitter-Follower
	EMP	: Emphasis
	EN	: Enable
	ENC	: Encoder
	ENV	: Envelope
	EOT	: End of Tape
	EP	: Extended Play
	EQ	: Equalizer
	ES	: Electronic Switch
	ESNS	: End Sensor
	EXP	: Expander
	EXT	: External
F	F	: Farad, Fuse
	F ADV	: Frame Advance
	FDP	: Fluorescent Display Panel
	FE	: Full Erase
	FET	: Field Effect Transistor
	FF	: **Fast Forward, Front Focus** Flipflop
	FG	: Frequency Generator
	FM	: Frequency Modulation
	FR	: Full Recording, Frame, Fusible Resistor
	FREQ	: Frequency
	F-V CONV	: Frequency to Voltage Converter
	FWD	: Forward
	FWD S	: Forward Search
G	G	: Green, Gate, Grid
	GEN	: Generator
	GND	: Ground
	GRN	: Green
	GRY	: Gray
H	H	: High, Henry, Hour
	HBF	: Horizontal Burst Flag
	HD	: Horizontal Drive
	HPF	: Highpass Filter
	Hz	: Herz

I	IC	: Integrated Circuit
	ID	: Identification (Pulse)
	IF	: Intermediate Frequency
	IFR	: Infrared
	IFT	: Intermediate Frequency Transformer
	IND	: Indicator
	INH	: Inhibit
	INS	: Insert
	INT	: Internal, Interrupt
	INV	: Inverter, Interleave
	I/O	: Input/Output
	IR	: Infrared
L	L	: Low, Left
	LCD	: Liquid Crystal Display
	LED	: Light Emitting Diode
	LIM	: Limiter
	LIN	: Linearity
	LLD	: Low Light Detector
	LOAD	: Loading (Cassette)
	LP	: Long Play
	LPF	: Lowpass Filter
	LSB	: Lower Sideband
M	M	: Motor, Mega
	MAX	: Maximum
	MDA	: Motor Drive Amplifier
	MECHACON	: Mechanism Control
	MIC	: Microphone
	MIN	: Minimum
	MIX	: Mixer, Mixing
	MMV	: Monostable Multivibrator
	MNOS	: Metal Nitride Oxide Semiconductor
	MOD	: Modulation, Modulator
	MODEM	: Modulator-Demodulator
	MON	: Monitor
	MOS	: Metal Oxide Semiconductor
	MPX	: Multiplexer, Multiplex
	MS	: Mode Select
	MUT	: Muting
N	NAND	: Not-And
	NC	: Not Connected, Normally Closed
	NFB	: Negative Feedback
	NLN	: Non-Linear
	NO	: Normally Open
	NOR	: Normal, Not-Or
	NR	: Noise Reduction
O	OP	: Operation
	OPAMP	: Operational Amplifier
	ORG	: Orange
	OSC	: Oscillator
P	PB	: Playback
	PC	: Photocoupler, Pulse Counter
	PCM	: Pulse Code Modulation
	PG	: Pulse Generator
	PGM	: Program
	PI	: Photo Interrupter
	PIC	: Picture Control
	PIF	: Picture Intermediate Frequency
	PLA	: Programmable Logic Array
	PLL	: Phase Locked Loop
	PNK	: Pink
	POS	: Position
	p-p	: Peak-to-Peak
	PR	: Pinch Roller
	PREAMP	: Preamplifier
	PRL	: Preroll
	P/S	: Pause/Still
	PSC	: Pulse Swallowing Control
	PU	: Pickup
	PUT	: Programmable Unijunction Transistor
	PWB	: Printed Wiring Board
	PWM	: Pulse Width Modulation
	PWR	: Power
Q	Q	: Quality Factor
R	R	: Red, Right
	RA	: Resistor Array
	RAM	: Random Access Memory
	REC	: Recording
	REF	: Reference
	REG	: Regulated, Regulator
	REM	: Remote
	REMOCON	: Remote Control (Unit)
	REV	: Reverse
	REV S	: Reverse Search
	REW	: Rewind
	RF	: Radio Frequency
	ROM	: Read Only Memory
	R/P	: Record/Playback
	RPT	: Repeat
	RS FF	: RS Flipflop
	RST	: Reset
	RT	: Rotary Transformer
	RUN	: Running
	RY	: Relay
S	SAW	: Sawtooth, Surface Acoustic Wave
	SC	: Subcarrier, Simulcast
	SCH	: Search
	SEL	: Select, Selector
	SENS	: Sensor
	SEP	: Separator
	SF	: Source Follower
	SFF	: Short Fast Forward
	SIF	: Sound Intermediate Frequency
	SN	: Signal to Noise Ratio
	SOL	: Solenoid
	SOS	: Sound on Sound
	SP	: Standard Play
	SR	: Supply Reel
	SREW	: Short Rewind
	S/S	: Slow/Still
	SSG	: Sync Signal Generator
	SSNS	: Start Sensor
	STD	: Strobe Data, Standard
	SUP	: Supply
	SW	: Switch
	SWD	: Switched
	SYNC	: Synchronization
T	TAL	: Tally
	TBC	: Time Base Corrector
	TC	: Tension Control, Time Code
	TEN	: Tension
	TF	: Thermal Fuse
	TIM	: Timing
	TK	: Tracking
	TNR	: Tuner
	TP	: Test Point
	TPZD	: Trapezoid
	TR	: Transistor, Trimmer
	TRANS	: Transformer
	TU	: Take-up
U	UL	: Unloading
	UNREG	: Unregulated
	UNSW	: Unswitched
V	V	: Vertical, Volt
	VACT	: Video Action
	VCO	: Voltage Controlled Oscillator
	VD	: Vertical Drive
	VIF	: Video Intermediate Frequency
	VLT	: Violet
	VR	: Variable Resistor
	VS	: Video and Sync
	VSCH	: Variable Search
	VV	: Video to Video
	VXO	: Variable Crystal Oscillator
W	W	: Watt
	WARN	: Warning
	W & D	: White and Dark
	WHT	: White
	WV	: Working Voltage
X	XTAL	: Crystal
Y	Y	: Luminance
	YEL	: Yellow

5.5 SEMICONDUCTOR SHAPES

	NAME	L
	IC	
A	AN1393S	1A
	AN2514S	7C
	AN78L05	8B
B	BA7043FS	2A
	BA7046F	1A
	BA7606F	7C
	BA7757BK	2C
	BU2728K	1C
	BU4053BF	7C
	BU4584BF	5C
C	CAT93C46K-XE	1A
H	HA118130MA	4B
	HA118149MA	4B
	HA13489MP	3C
I	IR3P67A	1B
J	JCY0001A2	2B
	JCY0002A1	3B
	JCY0007	6B
	JCY0011	2A
	JCY0012	7B
L	LB1851M	5A
	LM324DB	5C
	LM358DB-WE	1A
	LM393DB	1A
M	MM1031XM	4C
	MM1036XF	1A
	MN12821(QR)	6C
	MN18888JFGS	8C
	MN3110SA	2A
	MN4464S-08LL	8A
	MN5152S	8C
	MSM6832MS	2A
	MSM6834MS	1A
	M37120M6-102FP	7A
	M5237L	8B
	M5282FP	3A
	M54543AFP	6A
	M56780VP	2A
P	PEIC2396	5B
S	S-8052ANB-NE	8B
	S-8054HN-CB	8B
	S-81250HG-RD	8B
	S-87050AF	4A
T	TC4S584F	4A
	TC4S69F	4A
	TC7S04F	4A
	TL8808F	1A
U	UPC1093T	8B
V	VC5035	5A
	TRANSISTOR	
D	DTA114EE	1D
	DTA114EU	1D
	DTA124EE	1D
	DTA144EE	1D
	DTC114EE	1D
	DTC114EU	1D
	DTC124EU	1D
	DTC144EE	1D
F	FMU1	2D
U	UMG2	3D
	UMW1	4D
	UMZ1	6D
	UN9111	1D
	UN9113	1D
	UN9213	1D
X	XP2501	5D
	XP5601	5D
2	2SA1163-BL	1D
	2SA1532(BC)	1D
	2SA1577(PQR)	1D
	2SA1577(QR)	1D
	2SA1774(QRS)	1D
	2SA1774(RS)	1D
	2SB1132(QR)	7D
	2SB1218(QR)	1D
	2SC3936(BC)	1D
	2SC4181	1D
	2SC4617(QRS)	1D
	2SC4617(R)	1D
	2SC4617(RS)	1D
	2SD1819(QR)	1D
	2SD1898T100R	7D
	DIODE	
D	DAN222	1E
E	ERA22-10	5E
M	MA132WA	2E
	MA132WK	1E
	MA133	5E
	MA141WA	1E
	MA141WK	1E
	MA152WA	1E
	MA366	7E
	MA704	6E
R	RB451F	1E
	RD6.8M(B1)	6E
	RD7.5M(B2)	6E
	RLZ8.2B	4E
S	SLH-34VC3F	3E

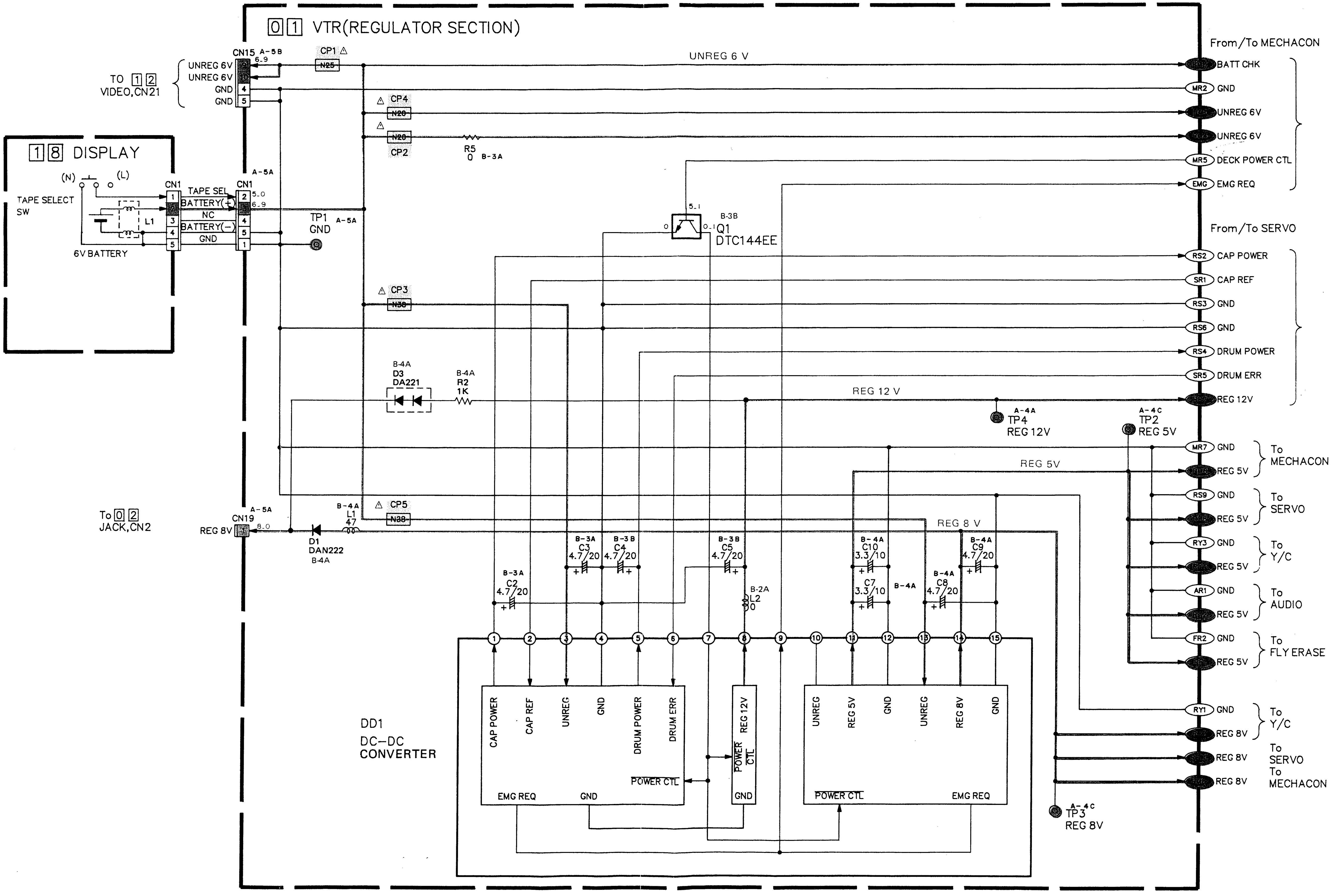
	IC			TRANSISTOR	DIODE
	A	B	C	D	E
1					 C A CATHODE A ANODE
2					 A C ANODE C CATHODE
3					 CATHODE ANODE
4					 CATHODE ANODE
5					 CATHODE ANODE
6					 CATHODE C A ANODE
7					 CATHODE ANODE
8					

5.6 REGULATOR SCHEMATIC DIAGRAM

- Shaded (▨) parts are critical for safety.
  Replace only with specified part numbers.

- Voltage
  REC : Y/C separator input, color bar SP mode, VHS mode.
  PB : Alignment tape, color bar SP mode, VHS mode.
  *Where voltage differ between recording and palyback, the voltage during playback is shown in parenthesis.

- Address of chip parts
  A-1D
  Address
  A : Discrete parts side
  B : Chip parts side



01 VTR(REGULATOR SECTION)
18 DISPLAY
TAPE SELECT SW
(N)
(L)
L1
6V BATTERY
CN1
TAPE SEL
BATTERY(+)
NC
BATTERY(−)
GND
TO 12 VIDEO,CN21
UNREG 6V
UNREG 6V
GND
GND
CN15 A-5B
6.9
CP1 △
N25
UNREG 6 V
△ CP4
N20
△
N20
CP2
R5 0 B-3A
A-5A
5.0
6.9
TP1 A-5A GND
5.1
B-3B
Q1 DTC144EE
0
0.1
△ CP3
N38
B-4A D3 DA221
B-4A R2 1K
REG 12 V
A-4A TP4 REG 12V
A-4C TP2 REG 5V
REG 5V
To 02 JACK,CN2
REG 8V
CN19 A-5A
8.0
D1 DAN222 B-4A
B-4A L1 47
△ CP5
N38
REG 8 V
B-3A C2 4.7/20
B-3A C3 4.7/20
B-3B C4 4.7/20
B-3B C5 4.7/20
B-2A L2 0
B-4A C10 3.3/10
C7 3.3/10
B-4A
B-4A C8 4.7/20
B-4A C9 4.7/20
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
DD1 DC–DC CONVERTER
CAP POWER
CAP REF
UNREG
GND
DRUM POWER
DRUM ERR
POWER CTL
EMG REQ
GND
REG 12V
POWER CTL
GND
UNREG
REG 5V
GND
UNREG
REG 8V
GND
POWER CTL
EMG REQ
A-4C TP3 REG 8V
From/To MECHACON
BATT CHK
MR2 GND
UNREG 6V
UNREG 6V
MR5 DECK POWER CTL
EMG EMG REQ
From/To SERVO
RS2 CAP POWER
SR1 CAP REF
RS3 GND
RS6 GND
RS4 DRUM POWER
SR5 DRUM ERR
REG 12V
MR7 GND
REG 5V
To MECHACON
RS9 GND
REG 5V
To SERVO
RY3 GND
REG 5V
To Y/C
AR1 GND
REG 5V
To AUDIO
FR2 GND
REG 5V
To FLY ERASE
RY1 GND
REG 8V
To Y/C
REG 8V
To SERVO
REG 8V
To MECHACON
6 5 4 3 2 1
A B C E F G H

5.7 SERVO SCHEMATIC DIAGRAM

- Voltage

REC : Y/C separator input, color bar SP mode, VHS mode.
PB : Alignment tape, color bar SP mode, VHS mode.
*Where voltage differ between recording and palyback, the voltage during playback is shown in parenthesis.

- Waveform

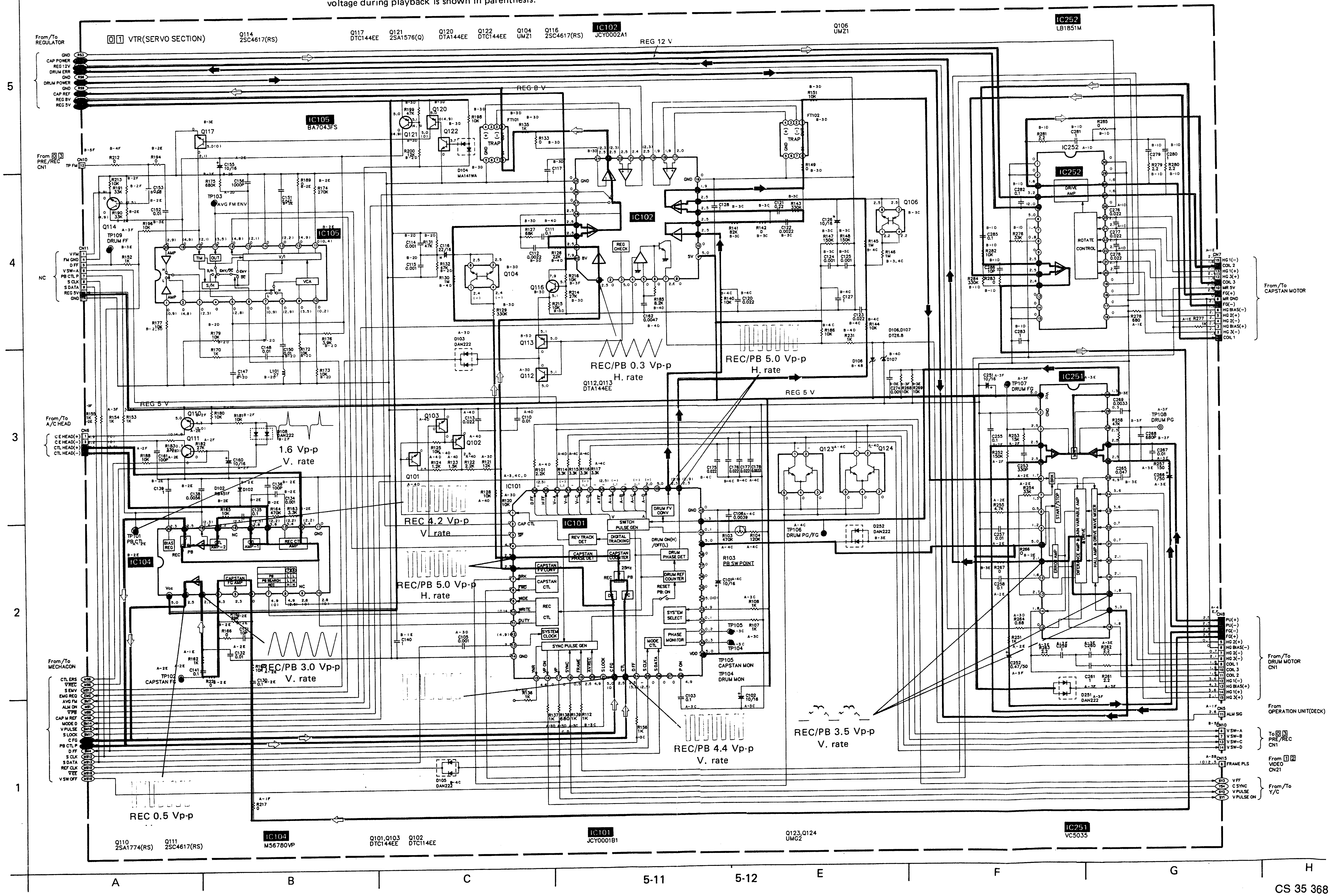
REC : Y/C separator input, color bar SP mode, VHS mode.
PB : Alignment tape, color bar SP mode, VHS mode.

- Address of chip parts

A-1D
Address
A : Discrete parts side
B : Chip parts side

- SIGNAL PATH

⬅ DRUM SERVO
⇦ CAPSTAN SERVO



6
5
4
3
2
1
01 VTR(SERVO SECTION)
From/To REGULATOR
GND
CAP POWER
REG 12V
DRUM ERR
GND
DRUM POWER
GND
CAP REF
REG 8V
REG 5V
Q114 2SC4617(RS)
Q117 DTC144EE
Q121 2SA1576(Q)
Q120 DTA144EE
Q122 DTC144EE
Q104 UMZ1
Q116 2SC4617(RS)
IC102 JCY0002A1
Q106 UMZ1
IC252 LB1851M
REG 12 V
REG 8 V
IC105 BA7043FS
From 03 PRE/REC CN1
TP FM
TP103 AVG FM ENV
TP109 DRUM FF
VFM
FM GND
D FF
V SW-A
PB CTL P
S CLK
S DATA
REG 5V
GND
NC
TRAP
FT101
FT102
D104 MA141WA
REG CHECK
IC102
Q106
ROTATE CONTROL
DRIVE AMP
From/To CAPSTAN MOTOR
HG 1(-)
COIL 2
HG 1(+)
HG 3(+)
COIL 3
MR 5V
FG(+)
MR GND
FG(-)
HG BIAS(-)
HG 2(+)
HG 2(-)
HG BIAS(+)
HG 3(-)
COIL 1
D103 DAN222
Q113
Q112
Q112,Q113 DTA144EE
REC/PB 0.3 Vp-p H. rate
REC/PB 5.0 Vp-p H. rate
REG 5 V
D106,D107 DTZ6.8
IC251
TP107 DRUM FG
TP108 DRUM PG
From/To A/C HEAD
CE HEAD(+)
CE HEAD(-)
CTL HEAD(+)
CTL HEAD(-)
Q110
Q111
D108 DAN222
1.6 Vp-p V. rate
Q103
Q102
Q101
IC101
REC 4.2 Vp-p V. rate
TP101 PB CTL
IC104
BIAS REG
CTL AMP-2
CTL AMP-1
REC CTL AMP
CAPSTAN FG AMP
PB SEARCH REC
REC/PB 5.0 Vp-p H. rate
REC/PB 3.0 Vp-p V. rate
TP102 CAPSTAN FG
From/To MECHACON
CTL ERS
V REC
S EMV
EMG REQ
AVG FM
ALM ON
VPB
CAP M REF
MODE D
V PULSE
S LOCK
CFG
PB CTL P
D FF
S CLK
S DATA
REF CLK
VEE
V SW OFF
REC 0.5 Vp-p
DRUM FV CONV
SWITCH PULSE GEN
REV TRACK DET
DIGITAL TRACKING
CAPSTAN PHASE DET
CAPSTAN COUNTER
DRUM PHASE DET
CAPSTAN FV CONV
CAPSTAN CTL
DRUM REF COUNTER
REC CTL
SYSTEM CLOCK
SYNC PULSE GEN
SYSTEM SELECT
PHASE MONITOR
MODE CTL
DRUM ON(H) /OFF(L)
RESET PB: ON
R103 PB SW POINT
TP105 CAPSTAN MON
TP104 DRUM MON
REC/PB 4.4 Vp-p V. rate
Q123
Q124
TP106 DRUM PG/FG
D252 DAN222
D105 DAN222
REC/PB 3.5 Vp-p V. rate
START/STOP
ERROR AMP
DIFFERENCE AMP & GAIN VARIABLE AMP
HALL AMP & DRIVE WAVE MIXER
D251 DAN222
From/To DRUM MOTOR CN1
PU(+)
PU(-)
FG(+)
FG(-)
HG 2(+)
HG BIAS(-)
HG 2(-)
HG 3(-)
COIL 1
COIL 3
COIL 2
HG 1(-)
HG BIAS(+)
HG 1(+)
HG 3(+)
From OPERATION UNIT(DECK)
ALM SIG
To 03 PRE/REC CN1
V SW-A
V SW-B
V SW-C
V SW-D
From 12 VIDEO CN21
FRAME PLS
From/To Y/C
V FF
C SYNC
V PULSE
V PULSE ON
Q110 2SA1774(RS)
Q111 2SC4617(RS)
IC104 M56780VP
Q101,Q103 DTC144EE
Q102 DTC114EE
IC101 JCY0001B1
Q123,Q124 UMG2
IC251 VC5035
A
B
C
D
E
F
G
H

CS 35 368

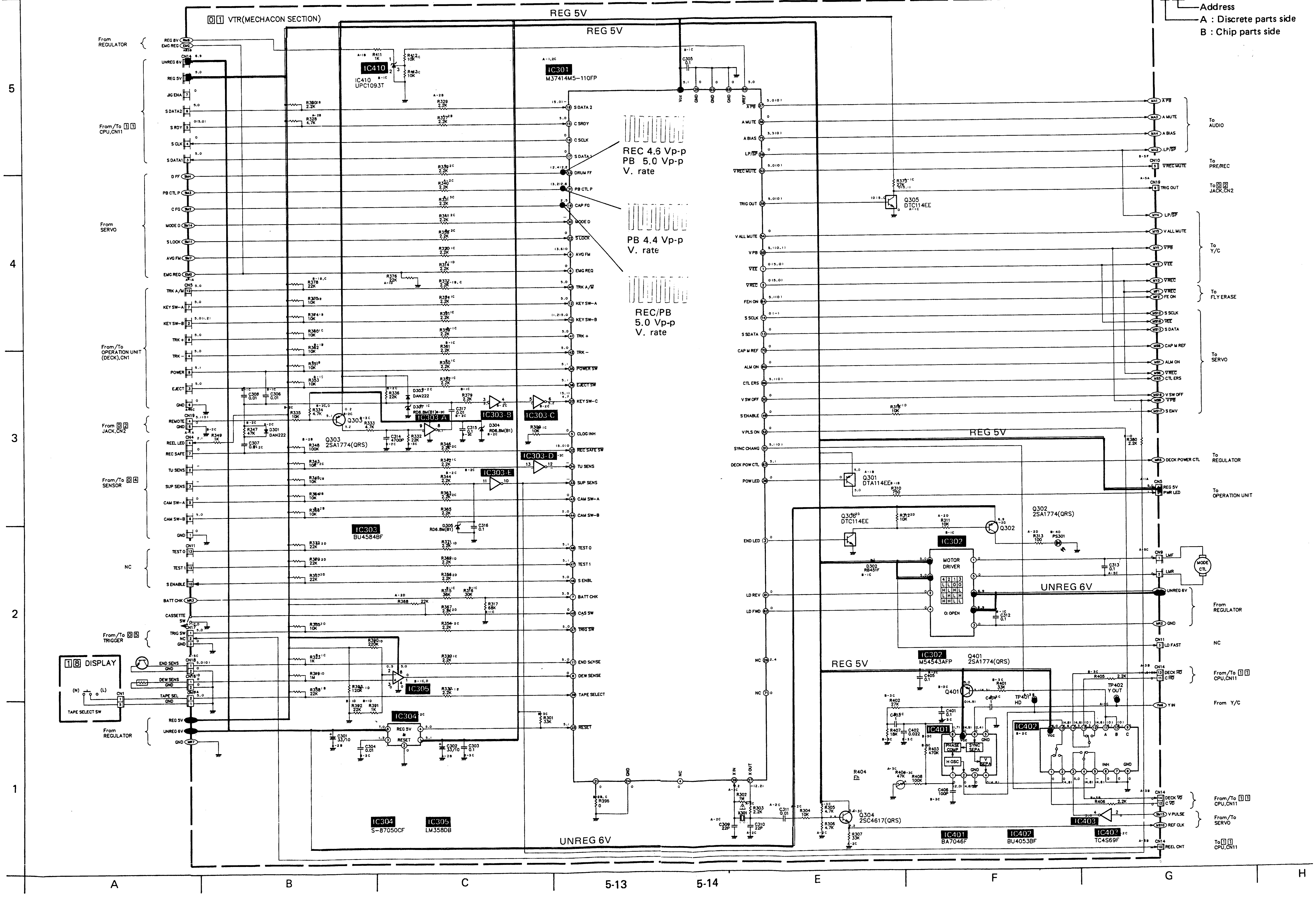
5.8 MECHACON SCHEMATIC DIAGRAM

- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

- Voltage
  REC : Y/C separator input, color bar SP mode, VHS mode.
  PB : Alignment tape, color bar SP mode, VHS mode.
  *Where voltage differ between recording and palyback, the voltage during playback is shown in parenthesis.

- Waveform
  REC : Y/C separator input, color bar SP mode, VHS mode.
  PB : Alignment tape, color bar SP mode, VHS mode.

- Address of chip parts
  A-1D
  Address
  A : Discrete parts side
  B : Chip parts side



01 VTR(MECHACON SECTION)
REG 5V
UNREG 6V
From REGULATOR
From/To 01 CPU,CN11
From SERVO
From/To OPERATION UNIT (DECK),CN1
From 02 JACK,CN2
From/To 04 SENSOR
NC
From/To 05 TRIGGER
18 DISPLAY
TAPE SELECT SW
IC410
UPC1093T
IC301
M37414M5-110FP
REC 4.6 Vp-p
PB 5.0 Vp-p
V. rate
PB 4.4 Vp-p
V. rate
REC/PB
5.0 Vp-p
V. rate
Q303
2SA1774(QRS)
IC303-A
IC303-B
IC303-C
IC303-D
IC303-E
IC303
BU4584BF
IC305
IC304
REG 5V & RESET
IC304
S-87050CF
IC305
LM358DB
To AUDIO
To PRE/REC
To 02 JACK,CN2
Q305
DTC114EE
To Y/C
To FLY ERASE
To SERVO
To REGULATOR
To OPERATION UNIT
Q301
DTA114EE
Q306
DTC114EE
Q302
2SA1774(QRS)
IC302
MOTOR DRIVER
D302
RB451F
0: OPEN
MODE CTL
From REGULATOR
NC
IC302
M54543AFP
Q401
2SA1774(QRS)
From/To 01 CPU,CN11
From Y/C
IC401
PHASE COMP
SYNC SEPA
H OSC
V SEPA
IC402
IC403
From/To 01 CPU,CN11
From/To SERVO
To 01 CPU,CN11
Q304
2SC4617(QRS)
IC401
BA7046F
IC402
BU4053BF
IC403
TC4S69F
6
5
4
3
2
1
A
B
C
E
F
G
H

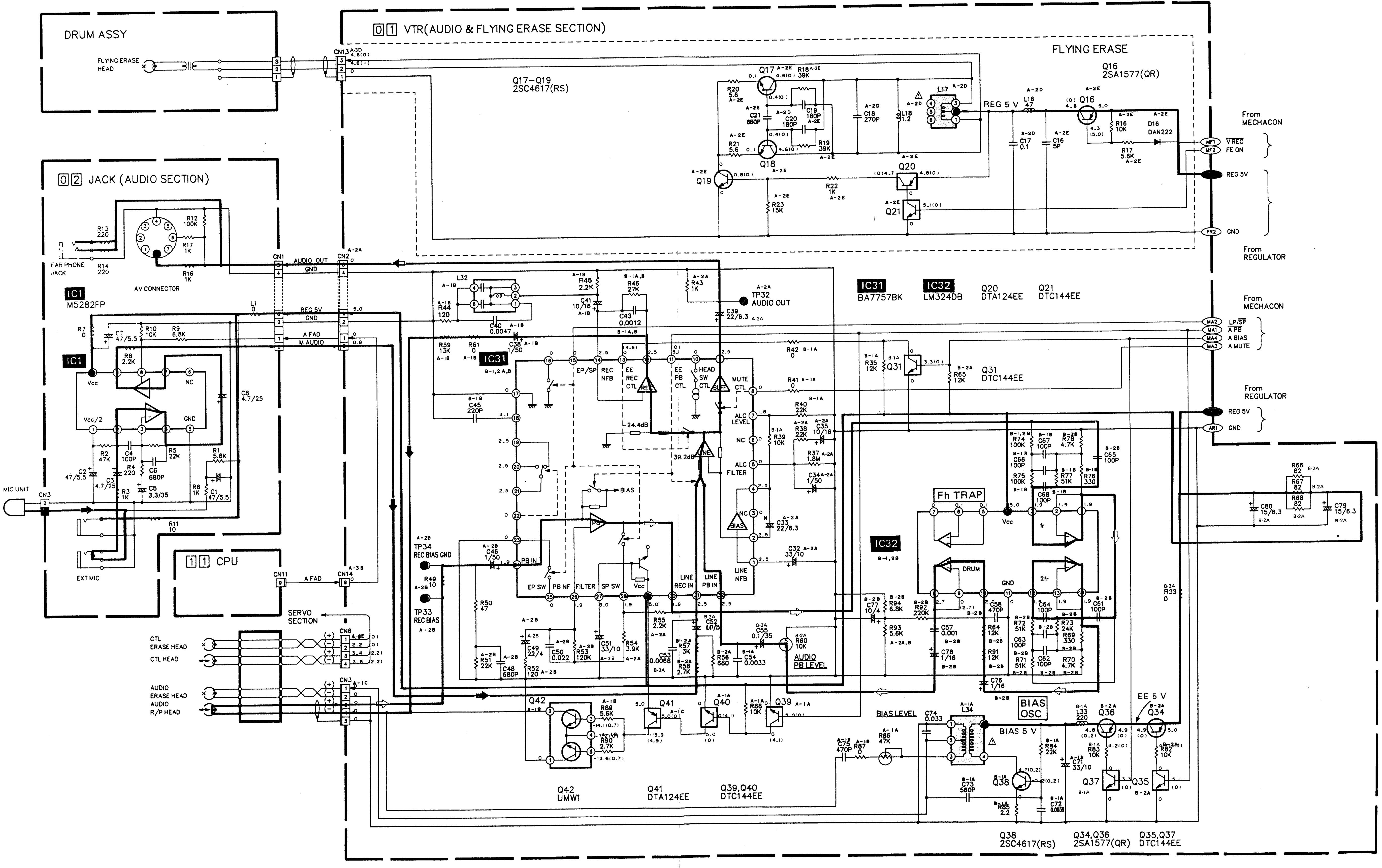
5.9 AUDIO SCHEMATIC DIAGRAM

- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

- Voltage
  REC : Y/C separator input, color bar SP mode, VHS mode.
  PB : Alignment tape, color bar SP mode, VHS mode.
  *Where voltage differ between recording and palyback, the voltage during playback is shown in parenthesis.

- Address of chip parts
  A-1D
  Address
  A : Discrete parts side
  B : Chip parts side

- SIGNAL PATH
  ← REC
  ⇦ PB
  ⇐ REC & PB



DRUM ASSY
FLYING ERASE HEAD
01 VTR(AUDIO & FLYING ERASE SECTION)
FLYING ERASE
Q17–Q19 2SC4617(RS)
Q16 2SA1577(QR)
REG 5 V
From MECHACON
VREC
FE ON
REG 5V
GND
From REGULATOR
02 JACK (AUDIO SECTION)
EAR PHONE JACK
AV CONNECTOR
IC1 M5282FP
AUDIO OUT
GND
REG 5V
A FAD
M AUDIO
TP32 AUDIO OUT
IC31 BA7757BK
IC32 LM324DB
Q20 DTA124EE
Q21 DTC144EE
LP/SP
A PB
A BIAS
A MUTE
Q31 DTC144EE
EP/SP
REC NFB
EE REC CTL
EE PB CTL
HEAD SW CTL
MUTE CTL
ALC LEVEL
NC
ALC FILTER
BIAS
LINE NFB
24.4dB
39.2dB
PB IN
EP SW
PB NF
FILTER
SP SW
Vcc
LINE REC IN
LINE PB IN
TP34 REC BIAS GND
TP33 REC BIAS
MIC UNIT
EXT MIC
11 CPU
A FAD
SERVO SECTION
CTL ERASE HEAD
CTL HEAD
AUDIO ERASE HEAD
AUDIO R/P HEAD
Fh TRAP
DRUM
GND
fr
2fr
AUDIO PB LEVEL
BIAS LEVEL
BIAS OSC
BIAS 5 V
EE 5 V
Q42 UMW1
Q41 DTA124EE
Q39,Q40 DTC144EE
Q38 2SC4617(RS)
Q34,Q36 2SA1577(QR)
Q35,Q37 DTC144EE

tical for safety.
part numbers.

- Voltage

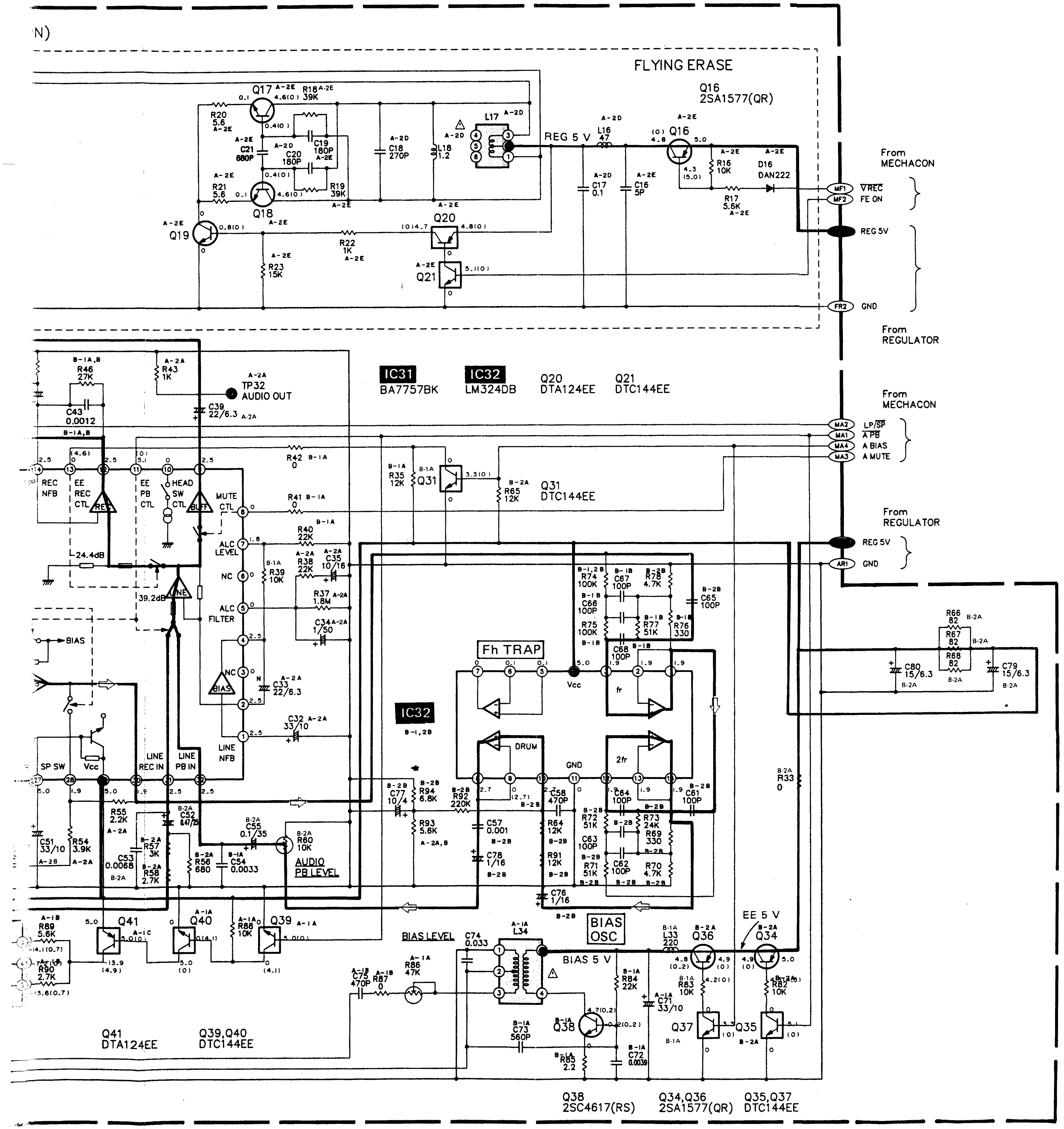
REC : Y/C separator input, color bar SP mode, VHS mode.
PB : Alignment tape, color bar SP mode, VHS mode.
*Where voltage differ between recording and palyback, the voltage during playback is shown in parenthesis.

- Address of chip parts

A-1D — Address
A : Discrete parts side
B : Chip parts side

- SIGNAL PATH

⬅ REC
⇦ PB
⬅ REC & PB



N)
FLYING ERASE
Q16 2SA1577(QR)
Q17
Q18
Q19
Q20
Q21
L17
REG 5 V
D16 DAN222
From MECHACON
VREC
FE ON
REG 5V
GND
From REGULATOR
IC31 BA7757BK
IC32 LM324DB
Q20 DTA124EE
Q21 DTC144EE
TP32 AUDIO OUT
LP/SP
APB
A BIAS
A MUTE
From MECHACON
Q31 DTC144EE
From REGULATOR
REG 5V
GND
REC NFB
EE REC CTL
EE PB CTL
HEAD SW CTL
MUTE CTL
ALC LEVEL
ALC FILTER
LINE NFB
BIAS
SP SW
LINE REC IN
LINE PB IN
AUDIO PB LEVEL
Fh TRAP
DRUM
GND
IC32
BIAS LEVEL
BIAS OSC
BIAS 5 V
EE 5 V
L34
Q41
Q40
Q39
Q38
Q36
Q34
Q37
Q35
Q41 DTA124EE
Q39,Q40 DTC144EE
Q38 2SC4617(RS)
Q34,Q36 2SA1577(QR)
Q35,Q37 DTC144EE

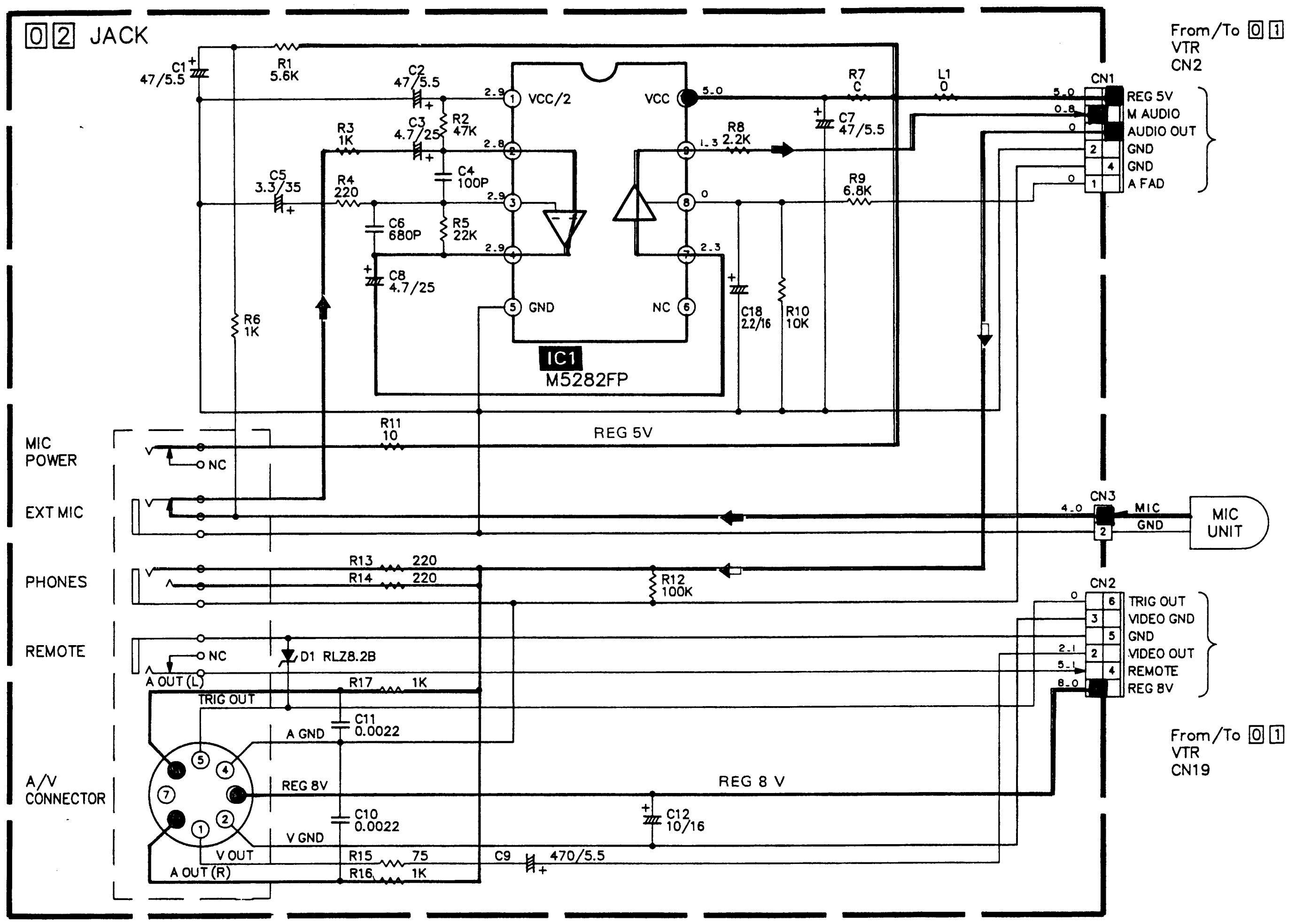
5.10 JACK SCHEMATIC DIAGRAM

- Address of chip parts

A-1D — Address
A : Discrete parts side
B : Chip parts side

- SIGNAL PATH

⬅ REC
⬅ REC & PB



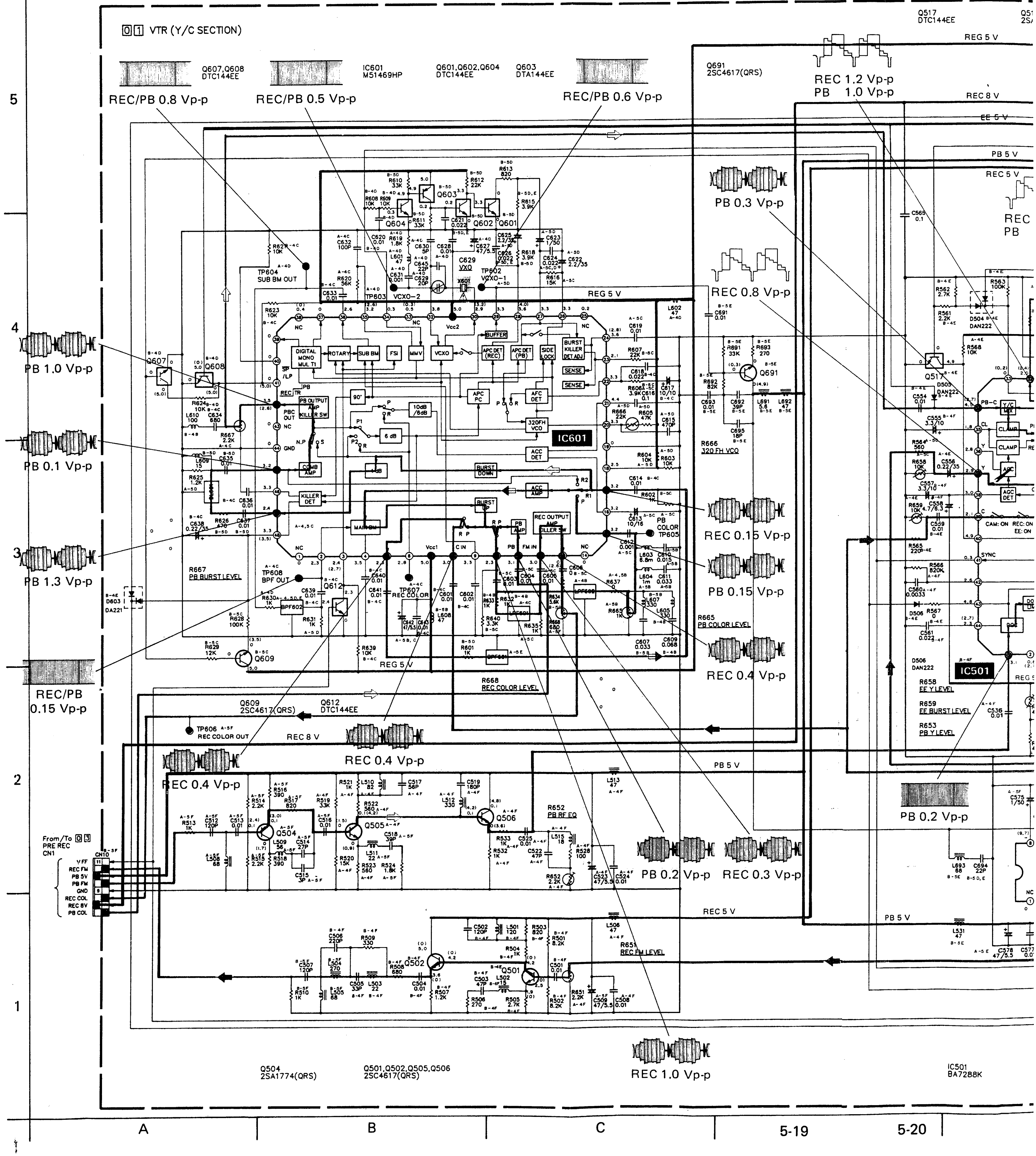
02 JACK
From/To 01 VTR CN2
C1 47/5.5
R1 5.6K
C2 47/5.5
R2 47K
C3 4.7/25
R3 1K
C4 100P
C5 3.3/35
R4 220
C6 680P
R5 22K
C8 4.7/25
R6 1K
IC1 M5282FP
VCC/2
VCC
GND
NC
R7 C
R8 2.2K
C7 47/5.5
R9 6.8K
C18 22/16
R10 10K
L1 0
CN1
REG 5V
M AUDIO
AUDIO OUT
GND
GND
A FAD
MIC POWER
EXT MIC
PHONES
REMOTE
A/V CONNECTOR
R11 10
REG 5V
CN3
MIC
GND
MIC UNIT
R13 220
R14 220
R12 100K
CN2
TRIG OUT
VIDEO GND
GND
VIDEO OUT
REMOTE
REG 8V
D1 RLZ8.2B
A OUT(L)
TRIG OUT
R17 1K
A GND
C11 0.0022
REG 8V
REG 8 V
C10 0.0022
C12 10/16
V GND
V OUT
A OUT(R)
R15 75
R16 1K
C9 470/5.5
From/To 01 VTR CN19
NC

5.11 Y/C SCHEMATIC DIAGRAM

● Shaded (▨) parts are critical for safety.
Replace only with specified part numbers.

● Voltage REC : Y/C separator input, color bar SP mode, VHS mode.
PB : Alignment tape, color bar SP mode, VHS mode.
*Where voltage differ between recording and palyback, the voltage during playback is shown in parenthesis.

● Waveform
REC : Y/C separator input, colo
PB : Alignment tape, color ba


6
5
4
3
2
1
A
B
C
01 VTR (Y/C SECTION)
Q607,Q608 DTC144EE
IC601 M51469HP
Q601,Q602,Q604 DTC144EE
Q603 DTA144EE
Q691 2SC4617(QRS)
Q517 DTC144EE
REC/PB 0.8 Vp-p
REC/PB 0.5 Vp-p
REC/PB 0.6 Vp-p
REC 1.2 Vp-p
PB 1.0 Vp-p
PB 0.3 Vp-p
REC 0.8 Vp-p
PB 1.0 Vp-p
PB 0.1 Vp-p
PB 1.3 Vp-p
REC/PB 0.15 Vp-p
REC 0.15 Vp-p
PB 0.15 Vp-p
REC 0.4 Vp-p
REC 0.4 Vp-p
REC 0.4 Vp-p
PB 0.2 Vp-p
REC 0.3 Vp-p
PB 0.2 Vp-p
REC 1.0 Vp-p
REG 5 V
REC 8 V
EE 5 V
PB 5 V
REC 5 V
IC601
IC501
TP604 SUB BM OUT
TP603 VCXO-2
TP602 VCXO-1
TP605 PB COLOR
TP607 REC COLOR
TP608 BPF OUT
TP606 REC COLOR OUT
R666 320 FH VCO
R665 PB COLOR LEVEL
R667 PB BURST LEVEL
R668 REC COLOR LEVEL
R652 PB RF EQ
R651 REC FM LEVEL
R658 EE Y LEVEL
R659 EE BURST LEVEL
R653 PB Y LEVEL
DIGITAL MONO MULT
ROTARY
SUB BM
FSI
MMV
VCXO
BUFFER
APC DET (REC)
APC DET (PB)
SIDE LOCK
BURST KILLER DET ADJ
SENSE
PB OUTPUT AMP KILLER SW
APC PC
AFC DET
320FH VCO
ACC DET
ACC AMP
BURST DOWN
BURST UP
COMB AMP
KILLER DET
MAIN CONV
REC OUTPUT AMP KILLER SW
PB AMP
BPF602
BPF601
LPF601
Q609 2SC4617(QRS)
Q612 DTC144EE
Q504
Q505
Q506
Q501
Q502
From/To 05 PRE REC CN1
Y-FF
REC FM
PB 5V
PB FM
GND
REC COL
REC 8V
PB COL
CN10
Q504 2SA1774(QRS)
Q501,Q502,Q505,Q506 2SC4617(QRS)
IC501 BA7288K
D603 DA221
D504 DAN222
D505 DAN222
D506 DAN222
CLAMP
AGC
SYNC
CAM: ON REC: ON EE: ON

5.11 Y/C SCHEMATIC DIAGRAM

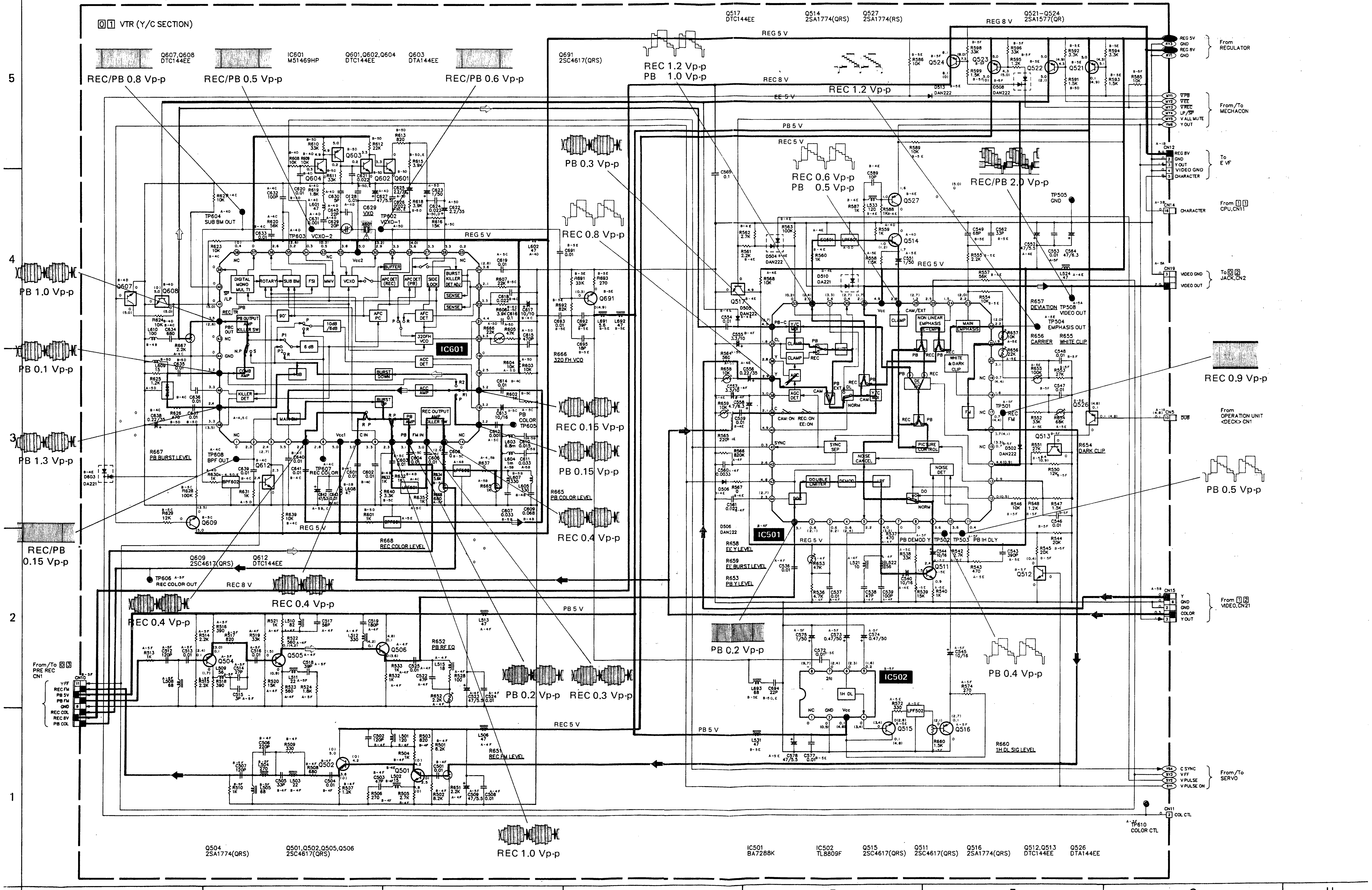
- Shaded (▨) parts are critical for safety.
  Replace only with specified part numbers.

- Voltage REC : Y/C separator input, color bar SP mode, VHS mode.
  PB : Alignment tape, color bar SP mode, VHS mode.
  *Where voltage differ between recording and palyback, the voltage during playback is shown in parenthesis.

- Waveform
  REC : Y/C separator input, color bar SP mode, VHS mode.
  PB : Alignment tape, color bar SP mode, VHS mode.

- Address of chip parts A-1D
  Address
  A : Discrete parts side
  B : Chip parts side

- SIGNAL PATH
  ⬅ REC
  ⇦ PB
  ⬅ REC & PB

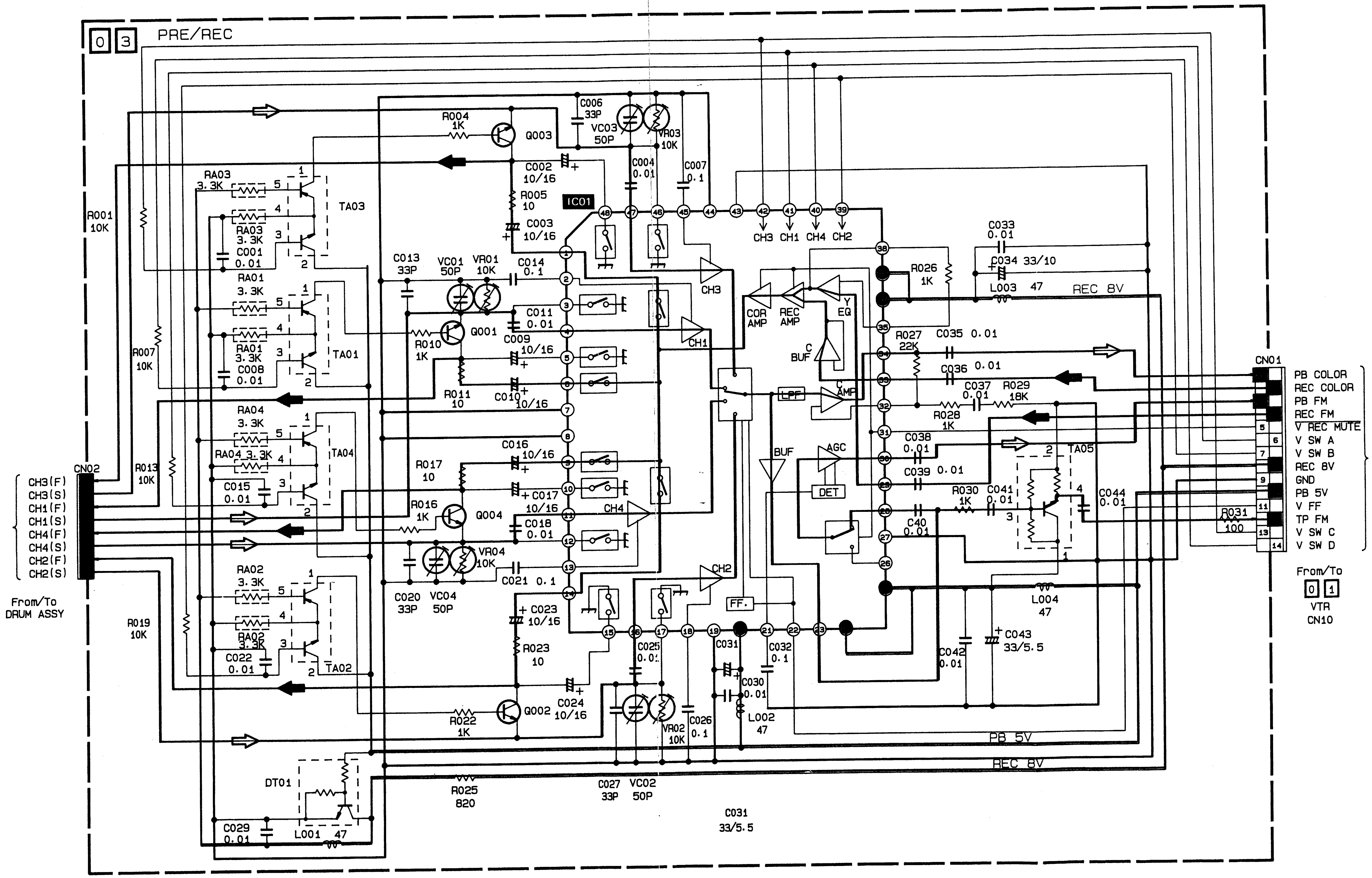


01 VTR (Y/C SECTION)
REC/PB 0.8 Vp-p
REC/PB 0.5 Vp-p
REC/PB 0.6 Vp-p
Q607,Q608 DTC144EE
IC601 M51469HP
Q601,Q602,Q604 DTC144EE
Q603 DTA144EE
Q691 2SC4617(QRS)
REC 1.2 Vp-p
PB 1.0 Vp-p
Q517 DTC144EE
Q514 2SA1774(QRS)
Q527 2SA1774(RS)
Q521–Q524 2SA1577(QR)
REG 5 V
REG 8 V
REC 8 V
EE 5 V
PB 5 V
REC 5 V
REC 1.2 Vp-p
PB 0.3 Vp-p
REC 0.8 Vp-p
REC 0.6 Vp-p
PB 0.5 Vp-p
REC/PB 2.0 Vp-p
PB 1.0 Vp-p
PB 0.1 Vp-p
PB 1.3 Vp-p
REC/PB 0.15 Vp-p
REC 0.15 Vp-p
PB 0.15 Vp-p
REC 0.4 Vp-p
REC 0.4 Vp-p
REC 0.4 Vp-p
PB 0.2 Vp-p
REC 0.3 Vp-p
REC 1.0 Vp-p
PB 0.2 Vp-p
PB 0.4 Vp-p
REC 0.9 Vp-p
PB 0.5 Vp-p
TP604 SUB BM OUT
TP603 VCXO-2
TP602 VCXO-1
C629 VXO
X601
IC601
DIGITAL MONO MULTI
ROTARY
SUB BM
FSI
MMV
VCXO
BUFFER
APC DET (REC)
APC DET (PB)
SIDE LOCK
BURST KILLER DET ADJ
SENSE
APC PC
AFC DET
320FH VCO
90°
10dB /6dB
6 dB
PB OUTPUT AMP
KILLER SW
PBC OUT
COMB AMP
KILLER DET
MAIN BM
BURST DOWN
ACC DET
ACC AMP
BURST
REC OUTPUT AMP
KILLER SW
PB COLOR
LPF601
BPF601
BPF602
CIN
Vcc1
Vcc2
TP605
TP606 REC COLOR OUT
TP607 REC COLOR
TP608 BPF OUT
R667 PB BURST LEVEL
R665 PB COLOR LEVEL
R668 REC COLOR LEVEL
R666 320 FH VCO
Q609 2SC4617(QRS)
Q612 DTC144EE
D603 DA221
Q504
Q505
Q506
R652 PB RF EQ
Q501
Q502
R651 REC FM LEVEL
From/To 03 PRE REC CN1
CN10
VFF
REC FM
PB 5V
PB FM
GND
REC COL
REC 8V
PB COL
Q504 2SA1774(QRS)
Q501,Q502,Q505,Q506 2SC4617(QRS)
IC501
Y/C MIX
CLAMP
PB-C
AGC
AGC DET
CAM
CAM ON REC ON EE ON
SYNC SEP
NOISE CANCEL
DOUBLE LIMITER
DEMOD
LPF
DO
NORM
CAM/EXT
NON LINEAR EMPHASIS
MAIN EMPHASIS
WHITE & DARK CLIP
PICTURE CONTROL
NOISE DET
FM
LPF601
LPF502
R657 DEVIATION
TP508 VIDEO OUT
TP504 EMPHASIS OUT
R656 CARRIER
R655 WHITE CLIP
TP505 GND
TP501 REC FM
R654 DARK CLIP
TP502 PB DEMOD Y
TP503 PB 1H DLY
R658 EE Y LEVEL
R659 EE BURST LEVEL
R653 PB Y LEVEL
D504 DAN222
D505 DAN222
D506 DAN222
D508 DAN222
D510 DA221
D513 DAN222
Q513
Q526
Q511
Q512
IC502
2fc
1H DL
Q515
Q516
R660 1H DL SIG LEVEL
REG 5V
GND
REG 8V
GND
From REGULATOR
VPB
VEE
VREC
LP/SP
V ALL MUTE
Y OUT
From/To MECHACON
CN12
REG 8V
GND
Y OUT
VIDEO GND
CHARACTER
To EVF
CN14
CHARACTER
From 01 CPU,CN11
CN19
VIDEO GND
VIDEO OUT
To 02 JACK,CN2
CN5
DUB
From OPERATION UNIT <DECK> CN1
CN15
Y
GND
GND
COLOR
Y OUT
From 02 VIDEO,CN21
C SYNC
VFF
V PULSE
V PULSE ON
From/To SERVO
CN11
COL CTL
TP610 COLOR CTL
IC501 BA7288K
IC502 TL8809F
Q515 2SC4617(QRS)
Q511 2SC4617(QRS)
Q516 2SA1774(QRS)
Q512,Q513 DTC144EE
Q526 DTA144EE
6
5
4
3
2
1
A
B
C
E
F
G
H

5.12 PRE/REC SCHEMATIC DIAGRAM

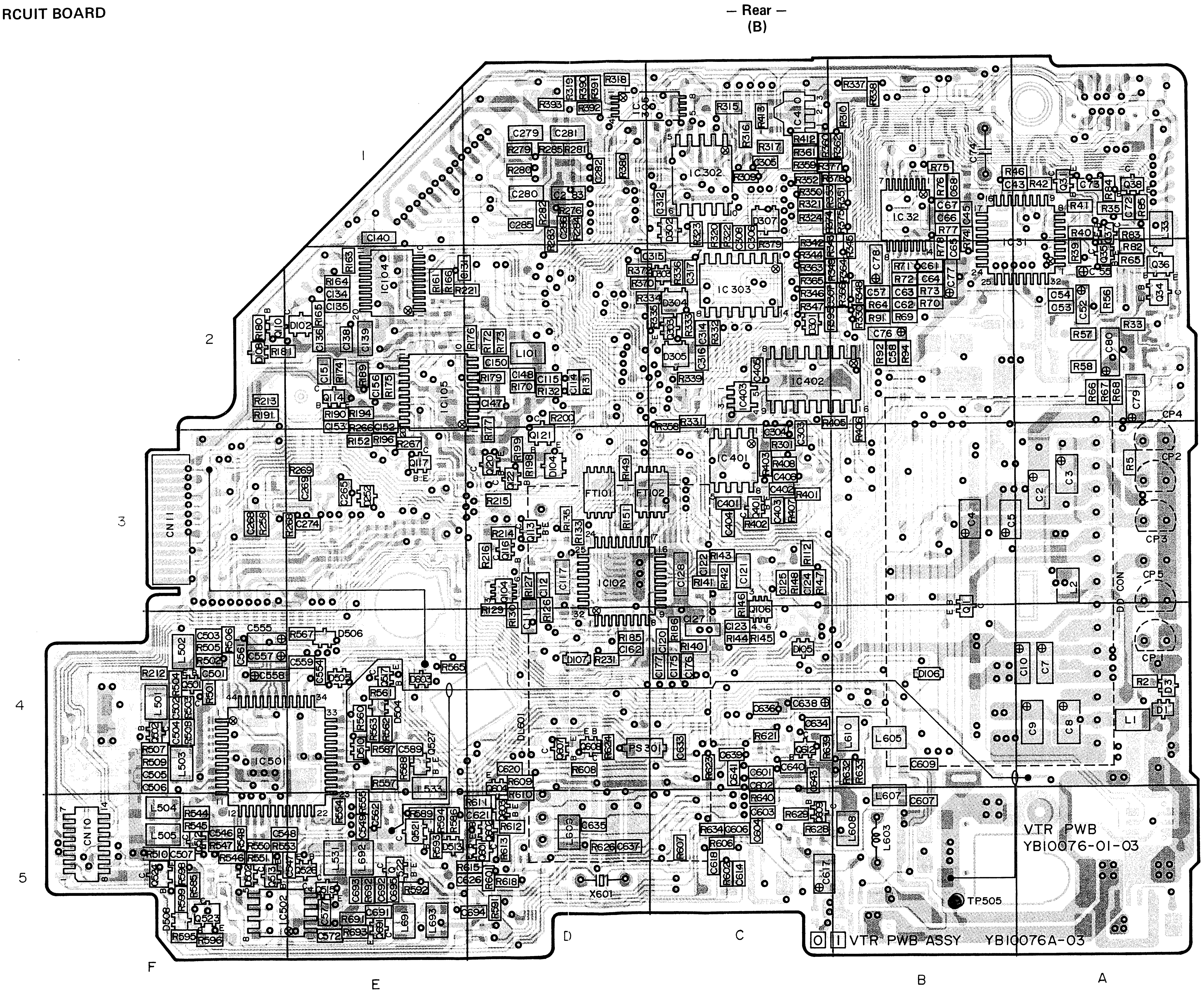
NOTE: This schematic diagram is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

● SIGNAL PATH
🡄 REC
⇦ PB

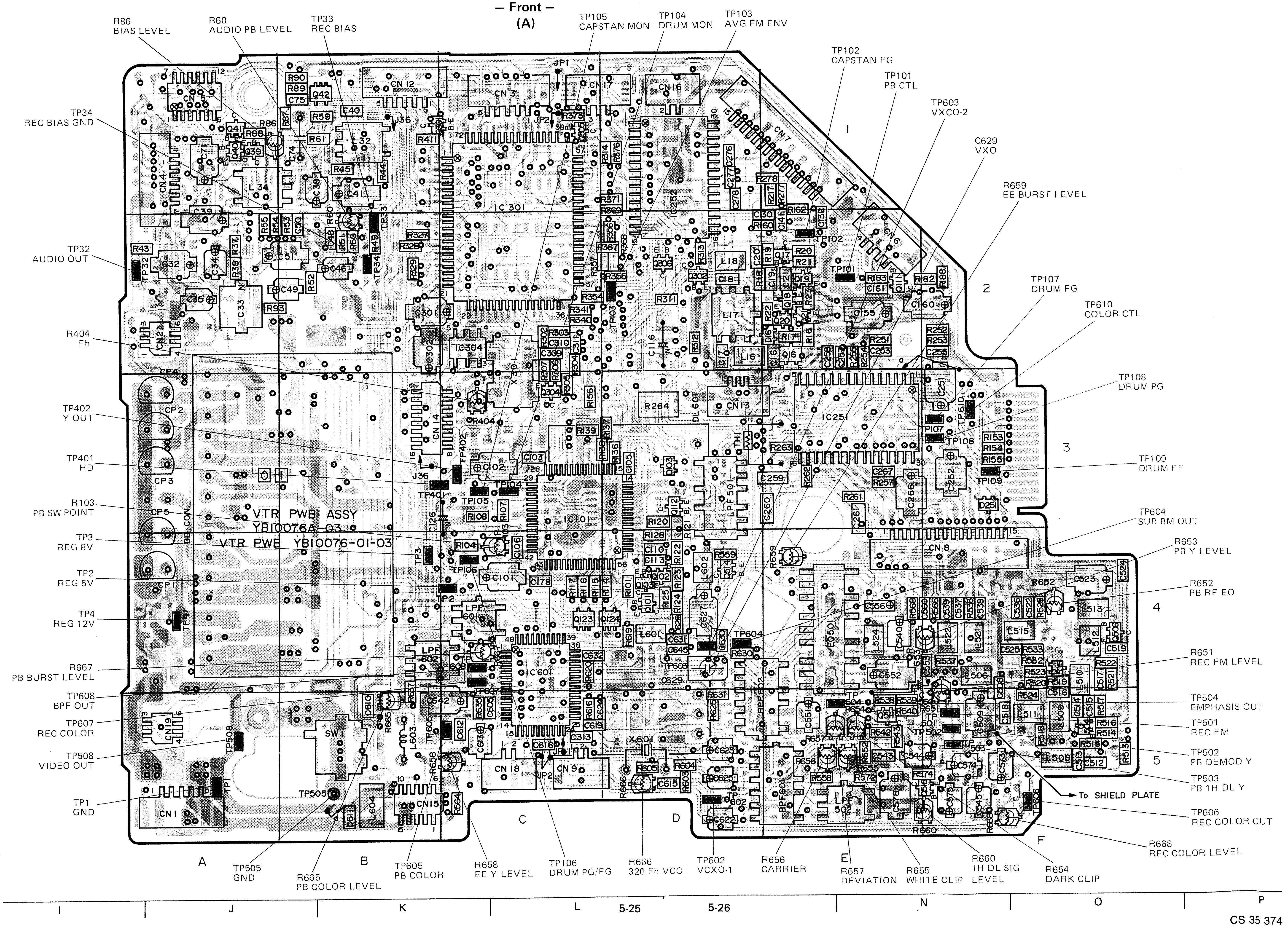


0 3 PRE/REC
CH3(F)
CH3(S)
CH1(F)
CH1(S)
CH4(F)
CH4(S)
CH2(F)
CH2(S)
From/To DRUM ASSY
CN02
R001 10K
R007 10K
R013 10K
R019 10K
RA03 3.3K
RA01 3.3K
RA04 3.3K
RA02 3.3K
C001 0.01
C008 0.01
C015 0.01
C022 0.01
TA03
TA01
TA04
TA02
DT01
C029 0.01
L001 47
R025 820
R004 1K
Q003
C006 33P
VC03 50P
VR03 10K
C004 0.01
C007 0.1
C002 10/16
R005 10
C003 10/16
IC01
C013 33P
VC01 50P
VR01 10K
C014 0.1
C011 0.01
Q001
R010 1K
C009 10/16
R011 10
C010 10/16
C016 10/16
R017 10
C017 10/16
R016 1K
Q004
C018 0.01
VR04 10K
C020 33P
VC04 50P
C021 0.1
C023 10/16
R023 10
C024 10/16
Q002
R022 1K
C025 0.01
VR02 10K
C026 0.1
C027 33P
VC02 50P
C031 33/5.5
C030 0.01
L002 47
C032 0.1
FF.
CH1
CH2
CH3
CH4
CH3 CH1 CH4 CH2
COR AMP
REC AMP
Y EQ
C BUF
LPF
C AMP
BUF
AGC
DET
C033 0.01
C034 33/10
L003 47
REC 8V
R026 1K
R027 22K
C035 0.01
C036 0.01
C037 0.01
R029 18K
R028 1K
C038 0.01
C039 0.01
R030 1K
C041 0.01
C40 0.01
TA05
C044 0.01
R031 100
C042 0.01
C043 33/5.5
L004 47
PB 5V
REC 8V
CN01
PB COLOR
REC COLOR
PB FM
REC FM
V REC MUTE
V SW A
V SW B
REC 8V
GND
PB 5V
V FF
TP FM
V SW C
V SW D
From/To 0 1 VTR CN10

5.13 VTR CIRCUIT BOARD

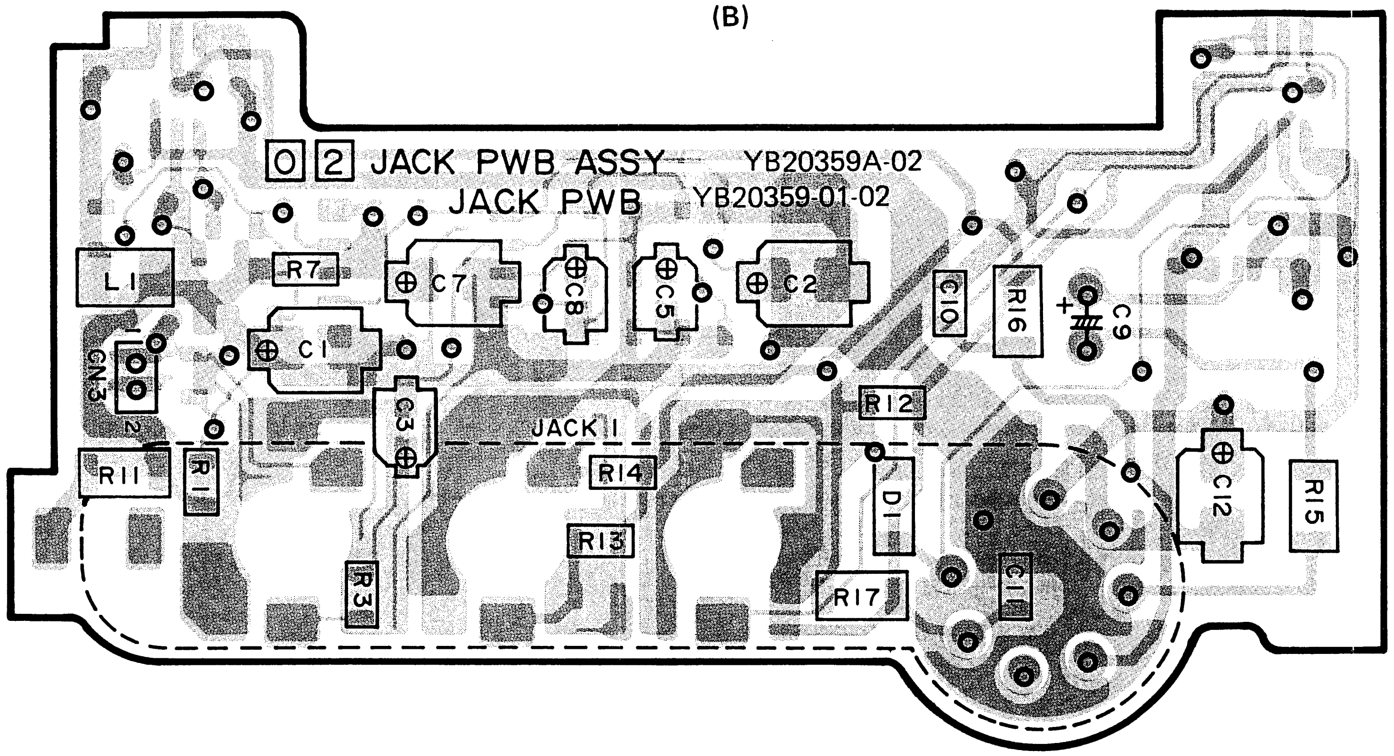

– Rear –
(B)
VTR PWB
YB10076-01-03
VTR PWB ASSY YB10076A-03
TP505
IC302
IC303
IC402
IC401
IC32
IC31
IC104
IC105
IC102
IC501
IC502
CN11
CN10
FT101
FT102
PS301
X601
DL601
DD CON
CP1
CP2
CP3
CP4
CP5
L1
L101
L501
L502
L503
L504
L505
L531
L603
L605
L607
L608
L610
L691
L692
L693
1
2
3
4
5
F
E
D
C
B
A
6
5
4
3
2
1
A
B
C
D
E
F
G

– Front –
(A)

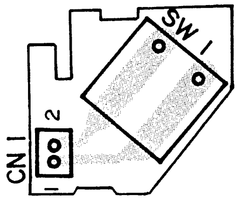

R86
BIAS LEVEL
R60
AUDIO PB LEVEL
TP33
REC BIAS
TP105
CAPSTAN MON
TP104
DRUM MON
TP103
AVG FM ENV
TP102
CAPSTAN FG
TP101
PB CTL
TP603
VXCO-2
C629
VXO
R659
EE BURST LEVEL
TP107
DRUM FG
TP610
COLOR CTL
TP108
DRUM PG
TP109
DRUM FF
TP604
SUB BM OUT
R653
PB Y LEVEL
R652
PB RF EQ
R651
REC FM LEVEL
TP504
EMPHASIS OUT
TP501
REC FM
TP502
PB DEMOD Y
TP503
PB 1H DL Y
To SHIELD PLATE
TP606
REC COLOR OUT
R668
REC COLOR LEVEL
TP34
REC BIAS GND
TP32
AUDIO OUT
R404
Fh
TP402
Y OUT
TP401
HD
R103
PB SW POINT
TP3
REG 8V
TP2
REG 5V
TP4
REG 12V
R667
PB BURST LEVEL
TP608
BPF OUT
TP607
REC COLOR
TP508
VIDEO OUT
TP1
GND
TP505
GND
R665
PB COLOR LEVEL
TP605
PB COLOR
R658
EE Y LEVEL
TP106
DRUM PG/FG
R666
320 Fh VCO
TP602
VCXO-1
R656
CARRIER
R657
DEVIATION
R655
WHITE CLIP
R660
1H DL SIG
LEVEL
R654
DARK CLIP
VTR PWB ASSY
YB10076A-03
VTR PWB YB10076-01-03
IC 301
IC251
IC101
IC601
CN 1
CN 2
CN 3
CN4
CN 5
CN 7
CN 8
CN 9
CN 12
CN13
CN 14
CN15
CN16
CN 17
CN 18
CN19
SW1
X601
JP1
JP2
A
B
C
D
E
F
1
2
3
4
5
I
J
K
L
5-25
5-26
N
O
P

5.14 JACK, TRIGGER & UPPER DRUM CIRCUIT BOARDS

— Rear —
(B)

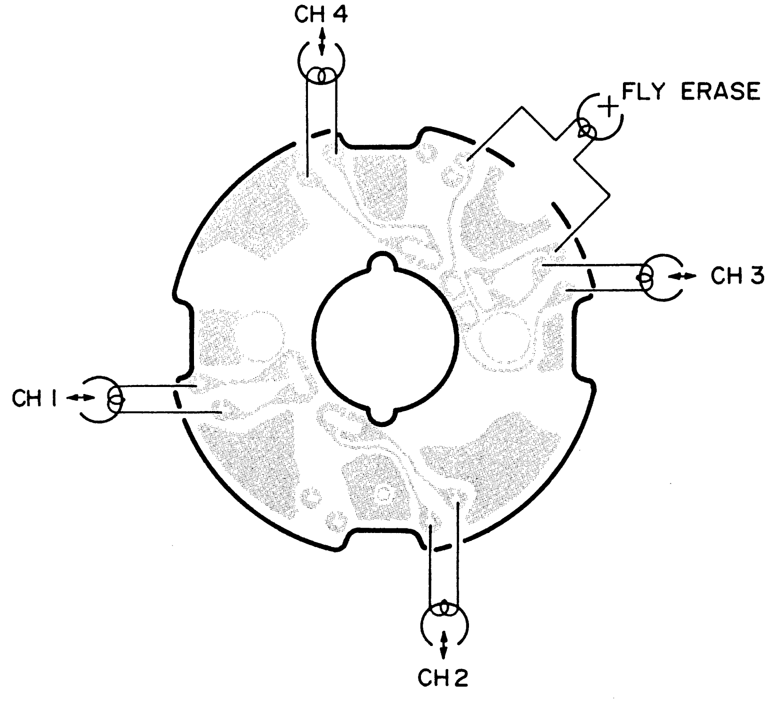

02 JACK PWB ASSY YB20359A-02
JACK PWB YB20359-01-02
L1
R7
C7
C8
C5
C2
C10
R16
C9
C1
CN3
1
2
C3
JACK 1
R12
R11
R1
R14
D1
C12
R15
R13
R3
R17
C11

— TRIGGER —



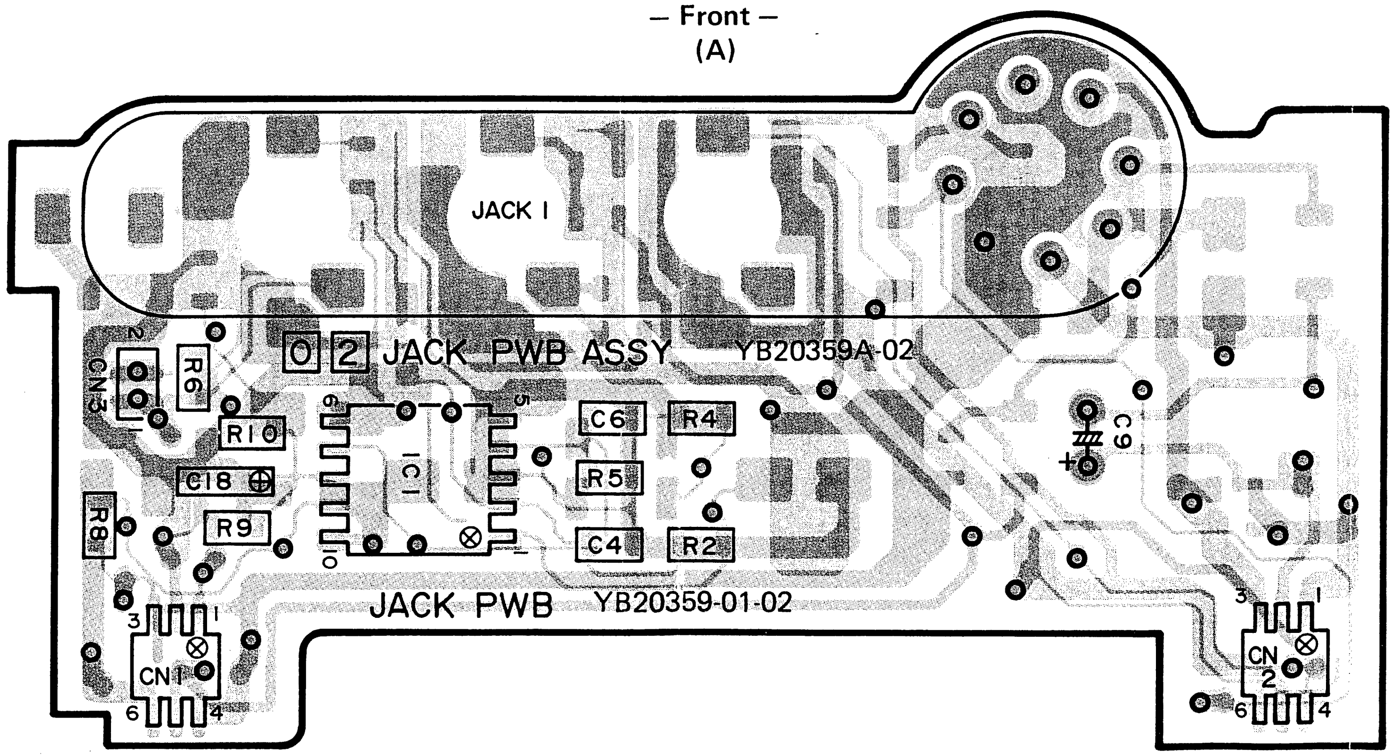
05 TRIGGER PWB ASSY YB20360A-01
TRIGGER PWB YB20360-01-01

— UPPER DRUM —


CH 4
FLY ERASE
CH 3
CH 1
CH 2

40 UPPER DRUM PWB
YDM3055-3

— Front —
(A)


JACK 1
02 JACK PWB ASSY YB20359A-02
CN3
2
R6
R10
C18
IC1
6
5
10
C6
R4
R5
C4
R2
R9
R8
C9
JACK PWB YB20359-01-02
CN1
CN2
3
1
6
4

6

5.15 OPERATION (DECK) SCHEMATIC DIAGRAM

5

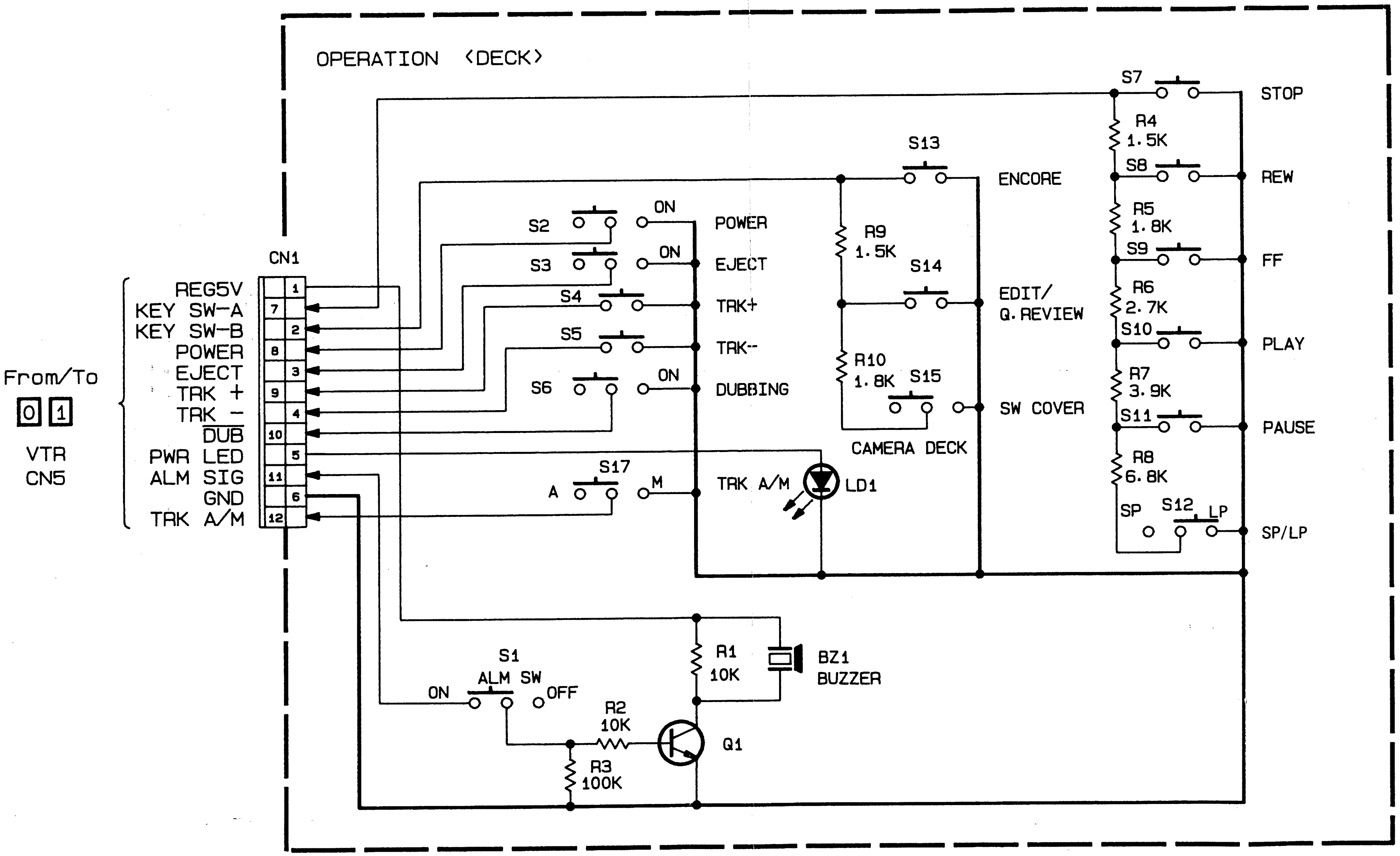
NOTE: This schematic diagram is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

4

3

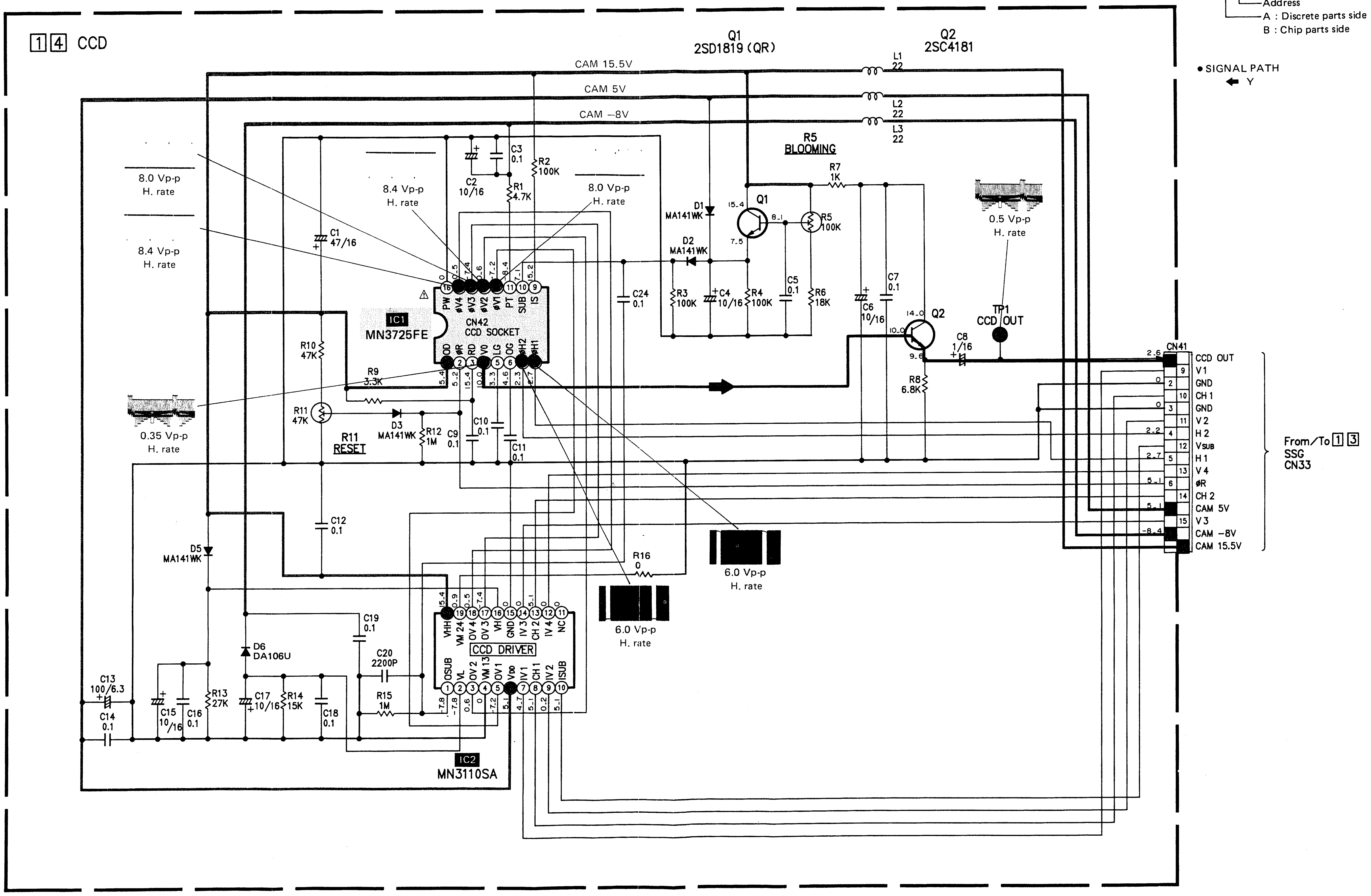
2

1


OPERATION <DECK>
From/To
0 1
VTR
CN5
CN1
REG5V
KEY SW-A
KEY SW-B
POWER
EJECT
TRK +
TRK −
DUB
PWR LED
ALM SIG
GND
TRK A/M
1
7
2
8
3
9
4
10
5
11
6
12
S2
ON
POWER
S3
ON
EJECT
S4
TRK+
S5
TRK−
S6
ON
DUBBING
S17
A
M
TRK A/M
LD1
S13
ENCORE
R9
1.5K
S14
EDIT/
Q.REVIEW
R10
1.8K
S15
SW COVER
CAMERA DECK
S7
STOP
R4
1.5K
S8
REW
R5
1.8K
S9
FF
R6
2.7K
S10
PLAY
R7
3.9K
S11
PAUSE
R8
6.8K
SP
S12
LP
SP/LP
S1
ALM SW
ON
OFF
R1
10K
BZ1
BUZZER
R2
10K
Q1
R3
100K

5.16 CCD SCHEMATIC DIAGRAM

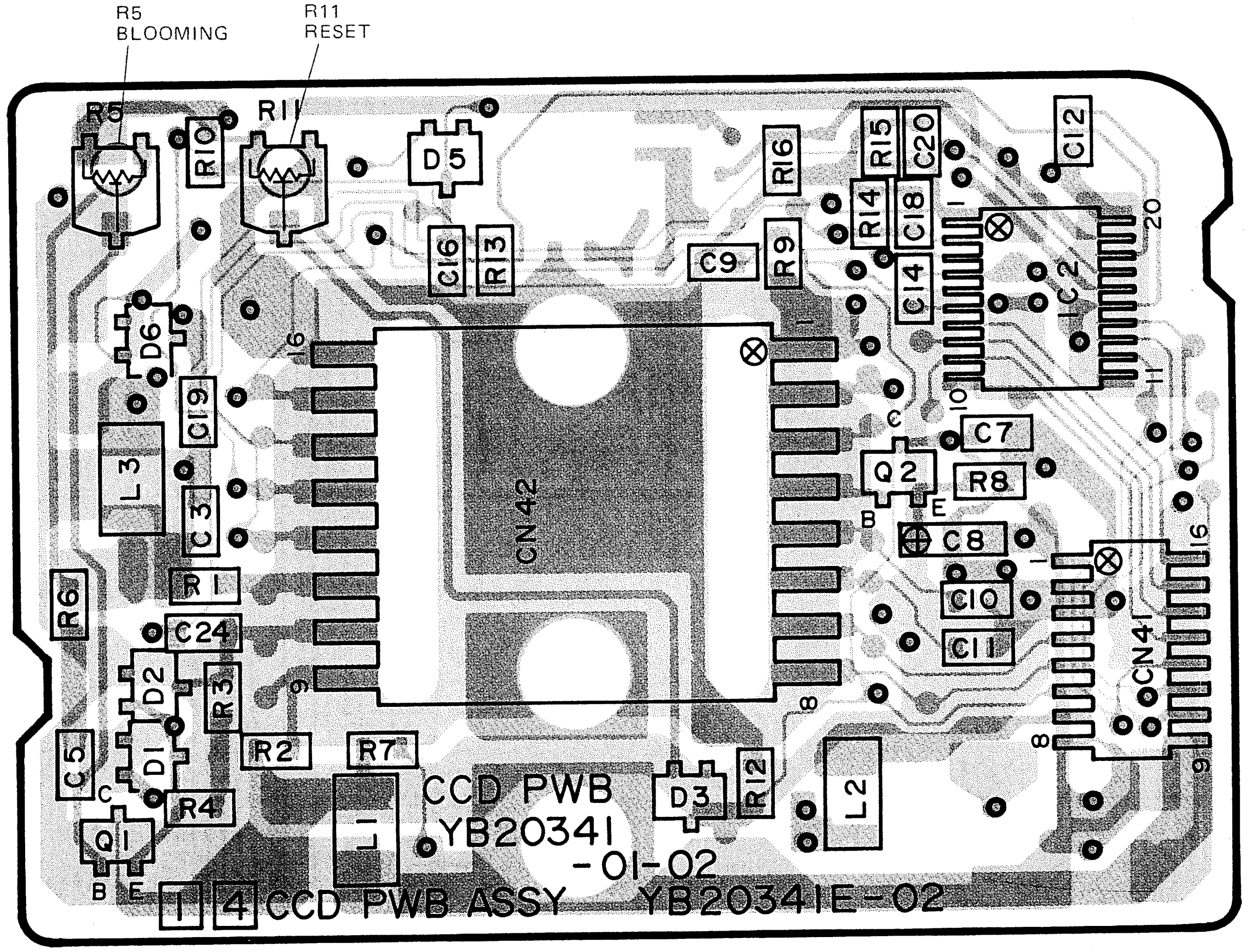
- Voltage : Measured as the color bar pattern which lighted up brightly is shot in the Rehersal mode.
- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.
- Waveform : Measured as the gray scale or color bar pattern which light up brightly is shot in the rehersal mode.
- Address of chip parts
  A-1D
  Address
  A : Discrete parts side
  B : Chip parts side
- SIGNAL PATH
  ⬅ Y



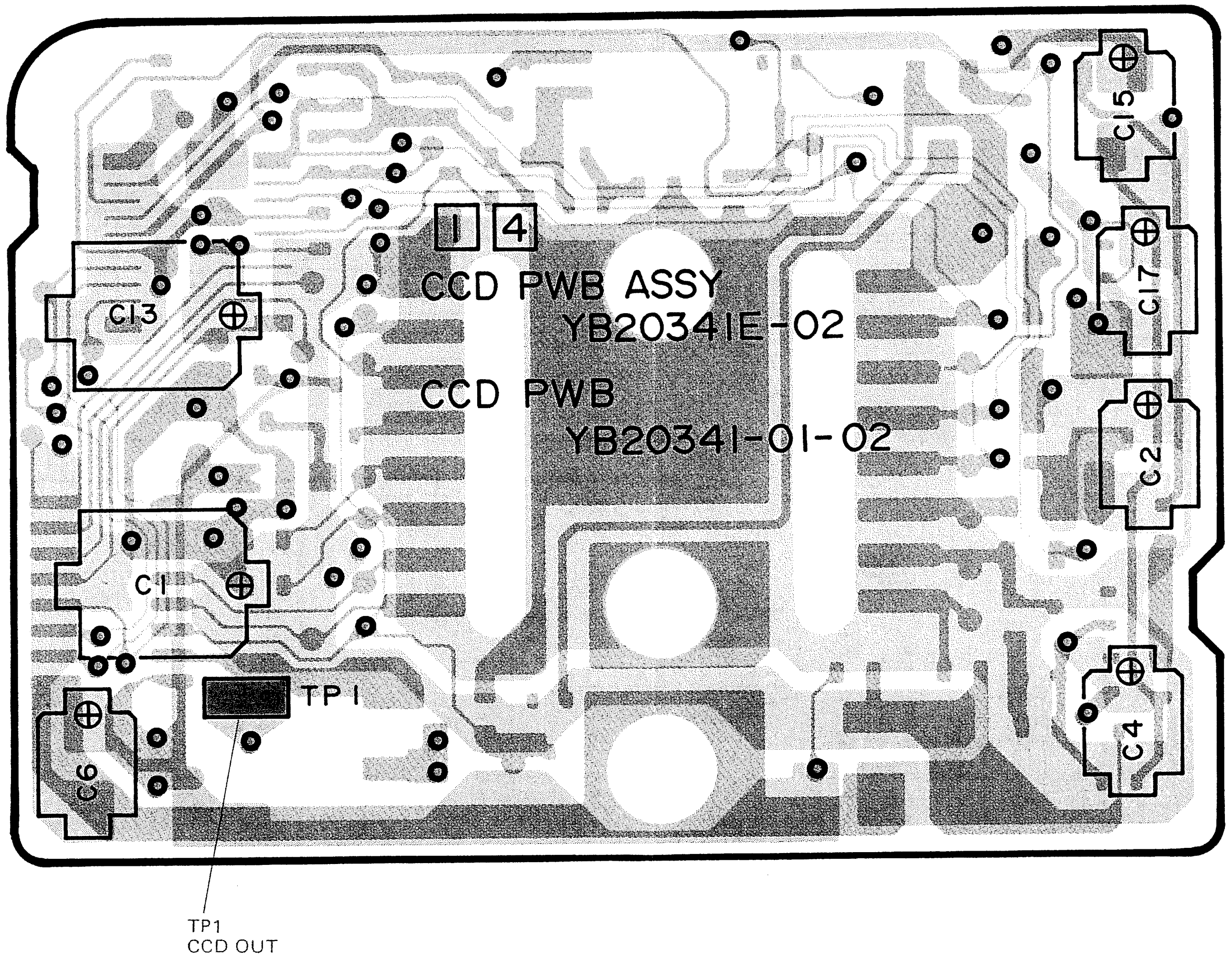
1 4 CCD
CAM 15.5V
CAM 5V
CAM –8V
Q1
2SD1819 (QR)
Q2
2SC4181
L1 22
L2 22
L3 22
R5
BLOOMING
R7 1K
R5 100K
D1 MA141WK
D2 MA141WK
R3 100K
C4 10/16
R4 100K
C5 0.1
R6 18K
C6 10/16
C7 0.1
C8 1/16
R8 6.8K
TP1
CCD OUT
0.5 Vp-p
H. rate
8.0 Vp-p
H. rate
8.4 Vp-p
H. rate
8.4 Vp-p
H. rate
8.0 Vp-p
H. rate
C2 10/16
C3 0.1
R2 100K
R1 4.7K
C1 47/16
C24 0.1
IC1
MN3725FE
CN42
CCD SOCKET
PW
øV4
øV3
øV2
øV1
PT
SUB
IS
OD
øR
RD
V0
LG
OG
øH2
øH1
R10 47K
R9 3.3K
R11 47K
R11
RESET
D3 MA141WK
R12 1M
C9 0.1
C10 0.1
C11 0.1
0.35 Vp-p
H. rate
C12 0.1
D5 MA141WK
R16 0
6.0 Vp-p
H. rate
6.0 Vp-p
H. rate
C19 0.1
D6 DA106U
C20 2200P
R15 1M
C13 100/6.3
C14 0.1
C15 10/16
C16 0.1
R13 27K
C17 10/16
R14 15K
C18 0.1
CCD DRIVER
VHH
VM 24
OV 4
OV 3
VH
GND
IV 3
CH 2
IV 4
NC
OSUB
VL
OV 2
VM 13
OV 1
VDD
IV 1
CH 1
IV 2
ISUB
IC2
MN3110SA
CN41
CCD OUT
V 1
GND
CH 1
GND
V 2
H 2
VSUB
H 1
V 4
øR
CH 2
CAM 5V
V 3
CAM –8V
CAM 15.5V
From/To 1 3
SSG
CN33

5.17 CCD CIRCUIT BOARD

— Rear —
(B)

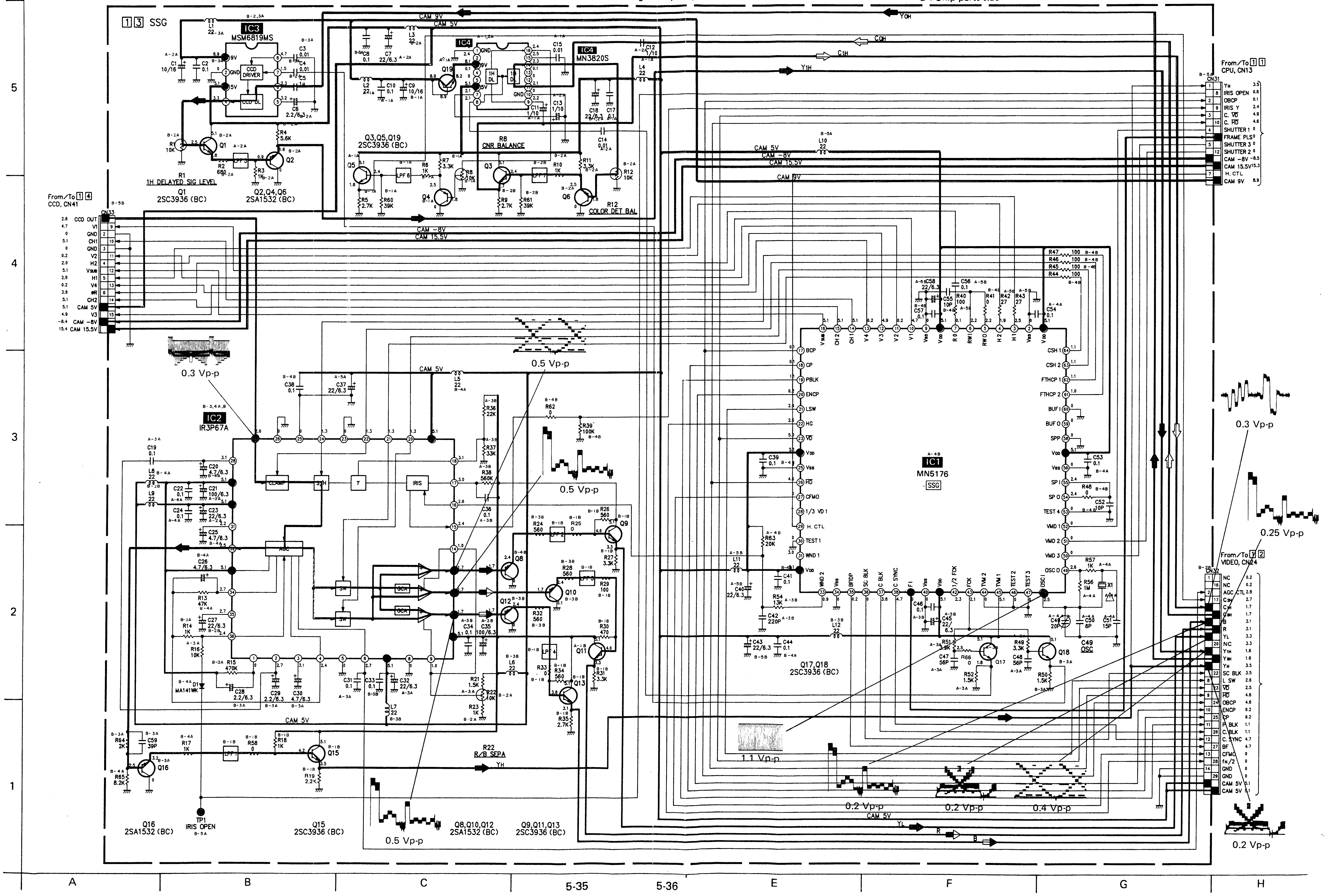

R5
BLOOMING
R11
RESET
R5
R10
R11
D5
C16
R13
C9
R16
R9
R15
C20
R14
C18
C14
IC2
C12
1
20
10
11
D6
16
1
C19
L3
C3
CN42
9
8
C
Q2
B
E
C7
R8
C8
C10
C11
1
16
CN41
8
9
R6
R1
C24
D2
R3
D1
C5
C
R2
R7
R4
Q1
B
E
L1
CCD PWB
YB20341
-01-02
D3
R12
L2
1
4
CCD PWB ASSY
YB20341E-02

— Front —
(A)


1
4
CCD PWB ASSY
YB20341E-02
CCD PWB
YB20341-01-02
C15
C17
C13
C2
C1
C4
C6
TP1
TP1
CCD OUT

5.18 SSG SCHEMATIC DIAGRAM

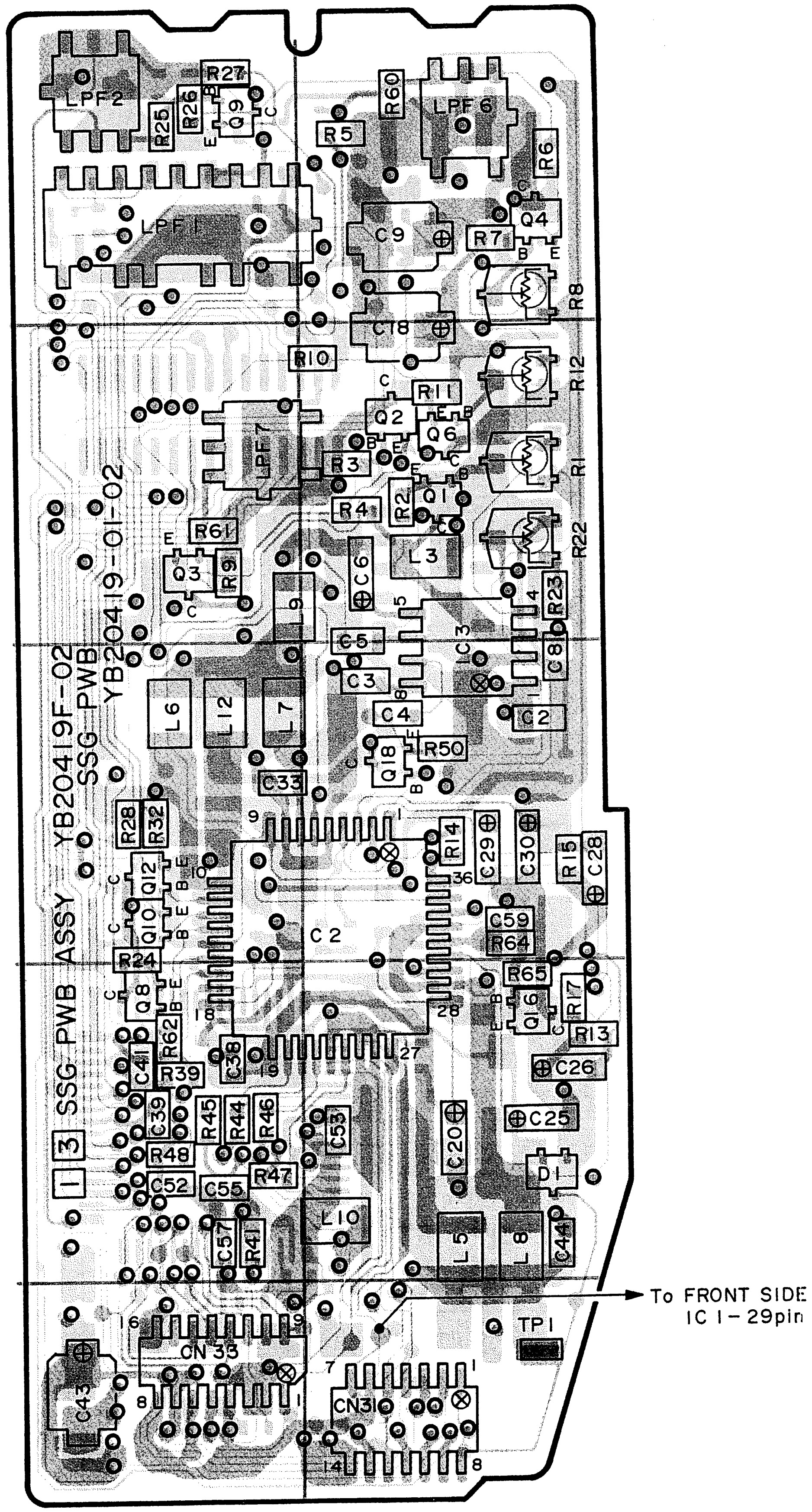
- Shaded (▨) parts are critical for safety.
  Replace only with specified part numbers.
- Voltage : Measured as the color bar pattern which lighted up brightly is shot in the Rehersal mode.
- Waveform : Measured as the grey scale pattern or color bar pattern which lighted up brightly is shot in the Rehersal mode.
- Address of chip parts
  A-1D — Address
  A : Discrete parts side
  B : Chip parts side
- SIGNAL PATH
  ◀ Y SIGNAL
  ⇦ COLOR (R-Y/B-Y) SIGNAL
  ⇦ R, R-Y SIGNAL
  ◀ B, B-Y SIGNAL



6
5
4
3
2
1
A
B
C
D
E
F
G
H
13 SSG
IC3
MSM6819MS
CCD DRIVER
CCD DL
IC4
IC4
MN3820S
1H DL
Q3,Q5,Q19
2SC3936 (BC)
R8
CNR BALANCE
R12
COLOR DET BAL
LPF 5
LPF 6
LPF 7
1H DELAYED SIG LEVEL
Q1
2SC3936 (BC)
Q2,Q4,Q6
2SA1532 (BC)
CAM 9V
CAM 5V
CAM -8V
CAM 15.5V
YOH
COH
C1H
Y1H
From/To 14
CCD, CN41
CN33
CCD OUT
V1
GND
CH1
GND
V2
H2
Vsub
H1
V4
φR
CH2
CAM 5V
V3
CAM -8V
CAM 15.5V
From/To 11
CPU, CN13
CN31
YH
IRIS OPEN
OBCP
IRIS Y
C. VD
C. HD
SHUTTER 1
FRAME PLS
SHUTTER 3
SHUTTER 2
CAM -8V
CAM 15.5V
H. CTL
CAM 9V
0.3 Vp-p
0.5 Vp-p
0.5 Vp-p
0.5 Vp-p
IC2
IR3P67A
CLAMP
S/H
IRIS
AGC
SW
GCA
IC1
MN5176
SSG
R47 100
R46 100
R45 100
R44 100
CSH 1
CSH 2
FTHCP 1
FTHCP 2
BUF I
BUF O
SPP
VDD
Vss
SP I
SP O
TEST 4
VMD 1
VMD 2
VMD 3
OSC O
OSC I
BCP
CP
PBLK
ENCP
LSW
HG
VD
CFMO
1/3 VD I
H. CTL
TEST 1
WND 1
WND 2
BFDP
SC BLK
C BLK
C SYNC
FI
1/2 FCK
FCK
YVM 2
YVM 1
TEST 2
TEST 3
Q17,Q18
2SC3936 (BC)
C49
OSC
X1
From/To 12
VIDEO, CN24
CN32
NC
AGC CTL
C2H
C1H
B
R
YL
YIH
Y0H
YH
SC BLK
L SW
HD
OBCP
ENCP
CP
P BLK
C BLK
C. SYNC
BF
CFMO
fH/2
GND
CAM 5V
0.3 Vp-p
0.25 Vp-p
0.2 Vp-p
1.1 Vp-p
0.2 Vp-p
0.2 Vp-p
0.4 Vp-p
R22
R/B SEPA
YH
YL
R
B
LPF 1
LPF 2
LPF 3
LPF 4
TP1
IRIS OPEN
Q16
2SA1532 (BC)
Q15
2SC3936 (BC)
Q8,Q10,Q12
2SA1532 (BC)
Q9,Q11,Q13
2SC3936 (BC)
MA141WK

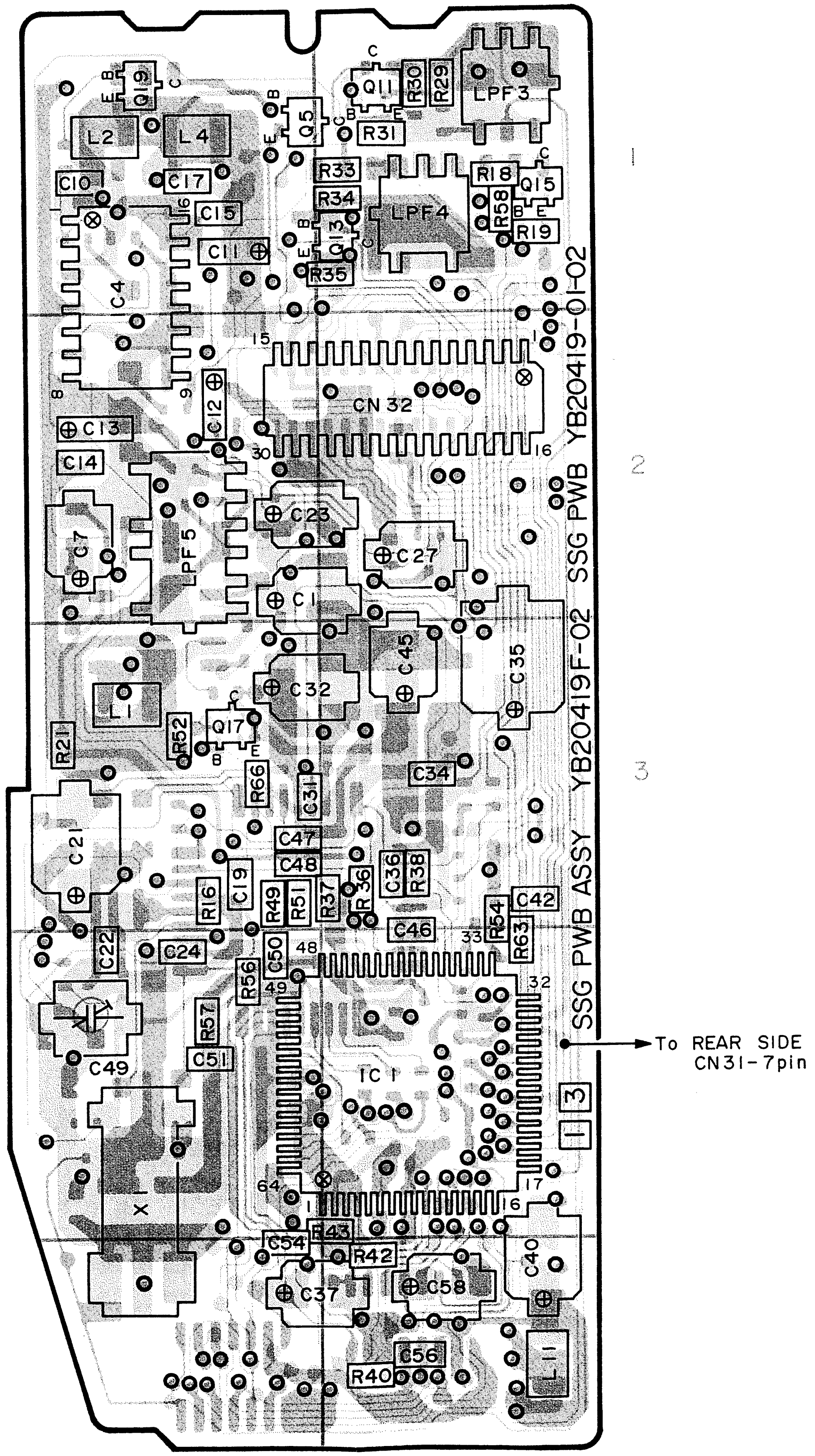
5.19 SSG CIRCUIT BOARD

— Rear —
(B)


LPF2
LPF1
LPF6
LPF7
R27
R25
R26
Q9
R60
R5
R6
C9
R7
Q4
R8
C18
R10
R11
R12
Q2
Q6
R3
R1
R4
R2
Q1
L3
R22
R61
Q3
R9
C6
R23
C5
C3
C8
C3
C4
C2
L6
L12
L7
R50
Q18
C33
R14
C29
C30
R15
C28
R28
R32
Q12
Q10
C2
C59
R64
R24
R65
Q8
Q16
R17
R62
R13
C41
R39
C38
C26
C39
R45
R44
R46
C53
C20
C25
R48
C52
C55
R47
D1
L10
C57
R41
L5
L8
C44
TP1
CN33
CN31
C43
SSG PWB ASSY YB20419F-02
SSG PWB YB20419-01-02

To FRONT SIDE IC 1-29pin

— Front —
(A)

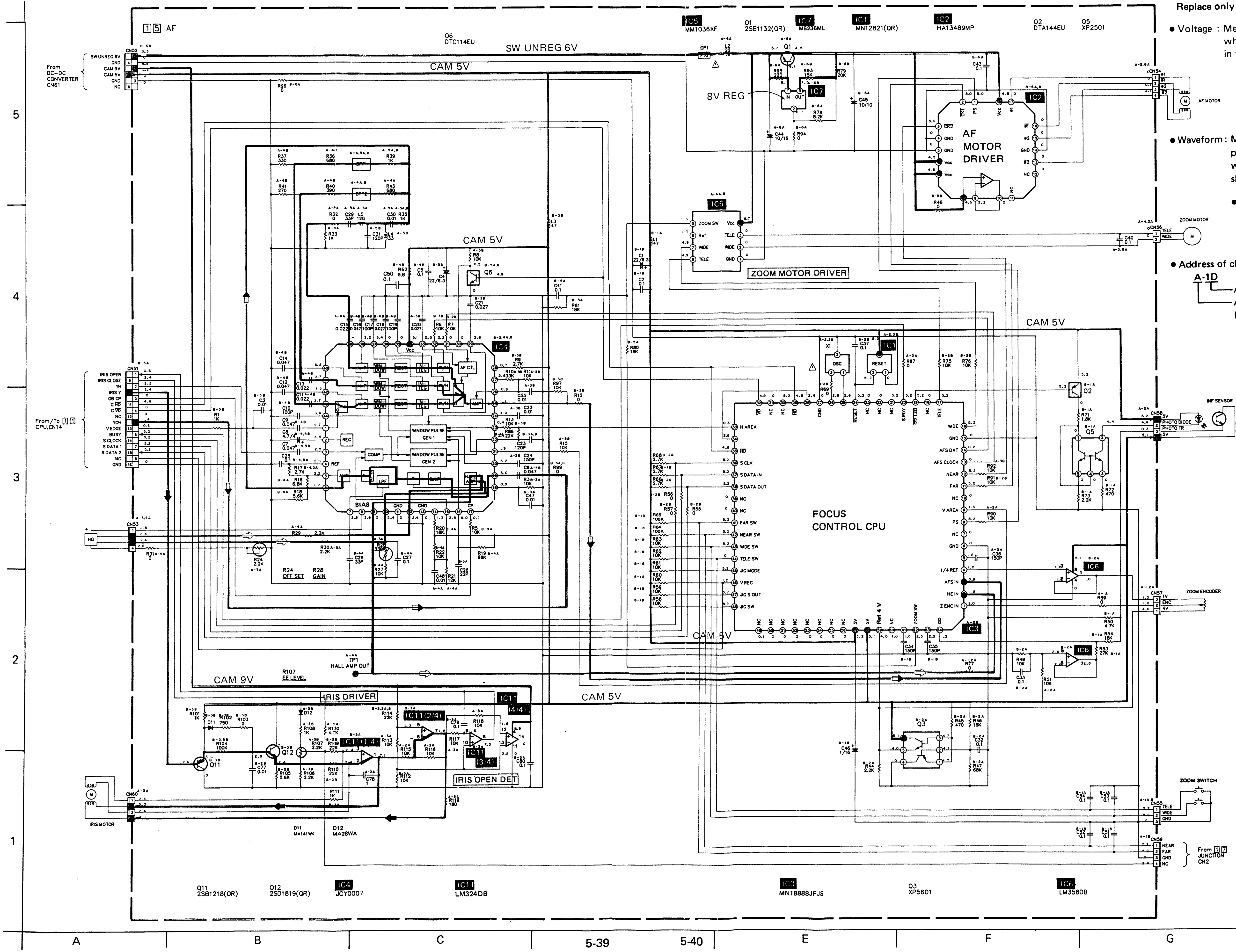

Q19
Q5
Q11
R30
R29
LPF3
L2
L4
R31
R33
R34
R18
R58
Q15
C10
C17
C15
LPF4
R19
Q13
C11
R35
C4
CN32
C12
C13
C14
LPF5
C23
C7
C27
C1
C45
C35
L1
C32
R21
R52
Q17
R66
C31
C34
C21
C47
C48
C19
R16
R49
R51
R37
R36
C36
R38
R54
C42
C22
C24
R56
C50
C46
R63
C49
R57
C51
IC1
X
C54
R43
R42
C37
C58
C40
C56
R40
L11
SSG PWB ASSY YB20419F-02
SSG PWB YB20419-01-02

To REAR SIDE CN31-7pin

5.20 AUTO FOCUS SCHEMATIC DIAGRAM

- Waveform : Measured as the grey scale pattern or color bar pattern which lighted up brightly is shot in the Rehersal mode.

- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.
- Voltage : Measured as the color bar pattern which lighted up brightly is shot in the Rehersal mode.
- Waveform : Measured as the grey scale pattern and color bar pattern which lighted up brightly is shot in the Rehersal mode.
- SIGNAL PATH
  - ⬅ IRIS
  - ⇦ HALL
  - ⬅ FORCUS
- Address of chip parts
  - A-1D
  - Address
  - A : Discrete parts side
  - B : Chip parts side



15 AF
IC5 MM1036XF
Q1 2SB1132(QR)
IC7 M5236ML
IC1 MN12821(QR)
IC2 HA13489MP
Q2 DTA144EU
Q5 XP2501
Q6 DTC114EU
SW UNREG 6V
CAM 5V
CAM 9V
From DC-DC CONVERTER CN61
SW UNREG 6V
GND
CAM 9V
CAM 5V
GND
NC
CN52
8V REG
AF MOTOR DRIVER
AF MOTOR
ZOOM MOTOR DRIVER
ZOOM MOTOR
TELE
WIDE
ZOOM SW
Ref
IC4
BIAS
WINDOW PULSE GEN 1
WINDOW PULSE GEN 2
COMP
REG
LPF
AF CTL
REF
From/To 11 CPU,CN14
IRIS OPEN
IRIS CLOSE
YH
IRIS Y
OB CP
C R0
C V0
NC
YOH
V EDGE
BUSY
S CLOCK
S DATA 1
S DATA 2
NC
GND
CN51
CN53
HG
R24 OFF SET
R28 GAIN
FOCUS CONTROL CPU
OSC
RESET
H AREA
S CLK
S DATA IN
S DATA OUT
FAR SW
NEAR SW
WIDE SW
TELE SW
JIG MODE
VREC
JIG S OUT
JIG SW
AFS DAT
AFS CLOCK
NEAR
FAR
V AREA
PS
1/4 REF
AFS IN
HE IN
Z ENC IN
Ref 4 V
INF SENSOR
PHOTO DIODE
PHOTO TR
CN58
ZOOM ENCODER
CN57
ENC
ZOOM SWITCH
CN55
CN59
From 17 JUNCTION CN2
IRIS DRIVER
IRIS OPEN DET
IC11 (1/4)
IC11 (2/4)
IC11 (3/4)
IC11 (4/4)
IC6
IC3
Q3
TP1 HALL AMP OUT
R107 EE LEVEL
IRIS MOTOR
CN60
D11 MA141WK
D12 MA28WA
Q11 2SB1218(QR)
Q12 2SD1819(QR)
IC4 JCY0007
IC11 LM324DB
IC3 MN18888JFJS
Q3 XP5601
IC6 LM358DB

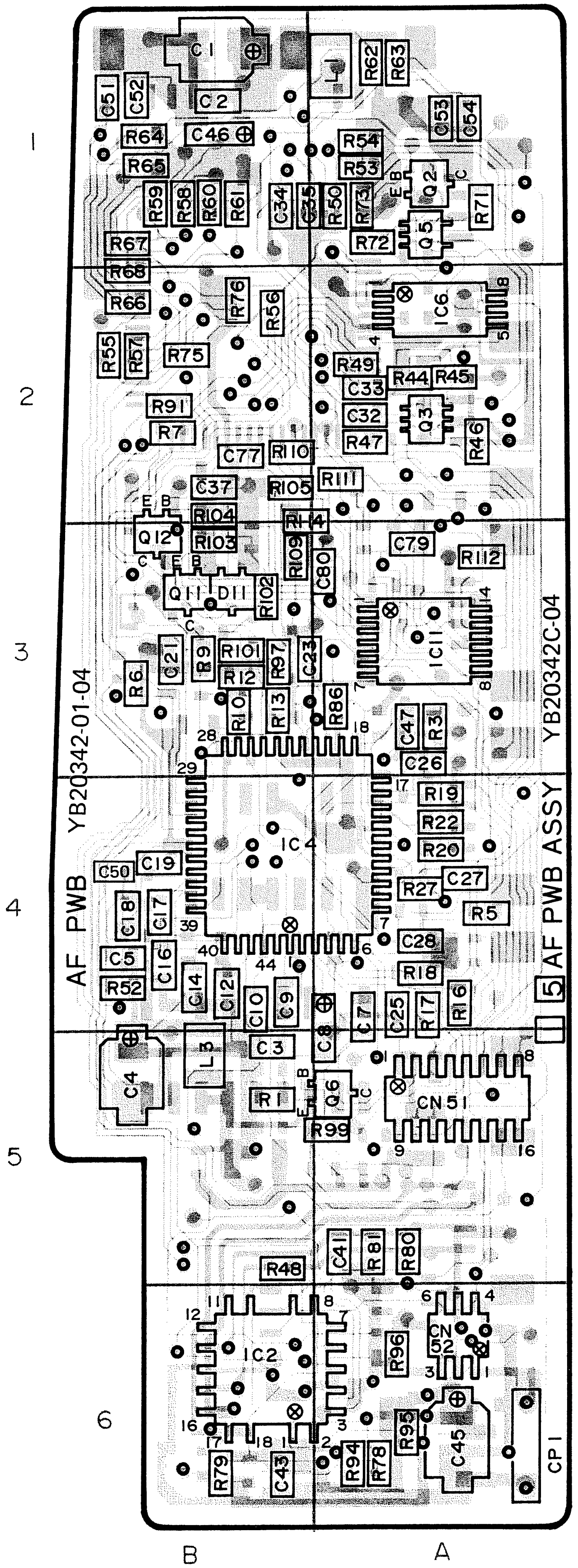
A B C D E F G H

1 2 3 4 5

6
5
4
3
2
1

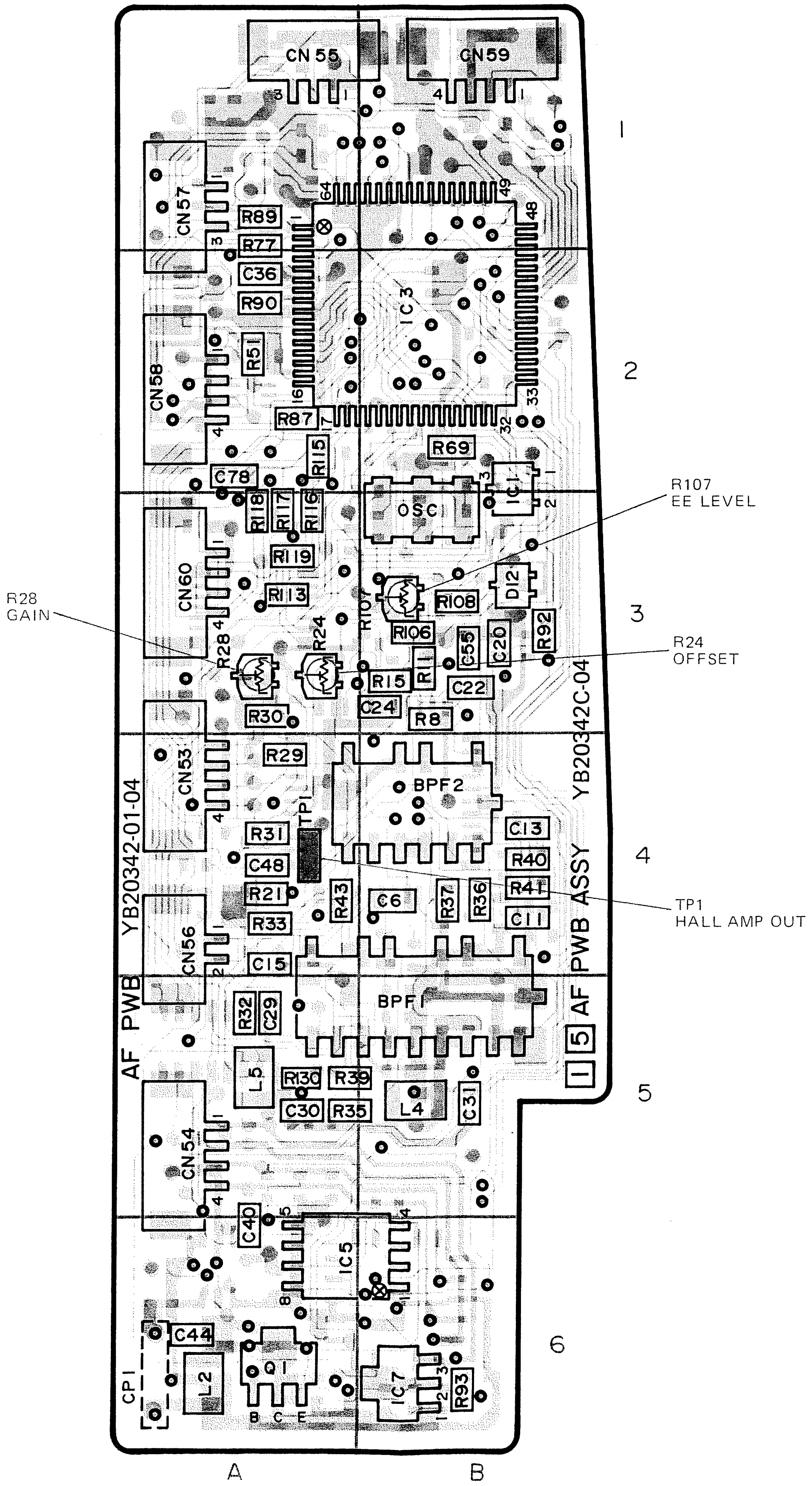
5.21 AUTO FOCUS CIRCUIT BOARD

– Rear –
(B)



YB20342-01-04
AF PWB ASSY
YB20342C-04
IC2
IC4
IC6
IC11
CN51
CN52
CP1
Q2
Q3
Q5
Q6
Q11
Q12
D11
C1
C4
C45
L1
L3
1
2
3
4
5
6
B
A

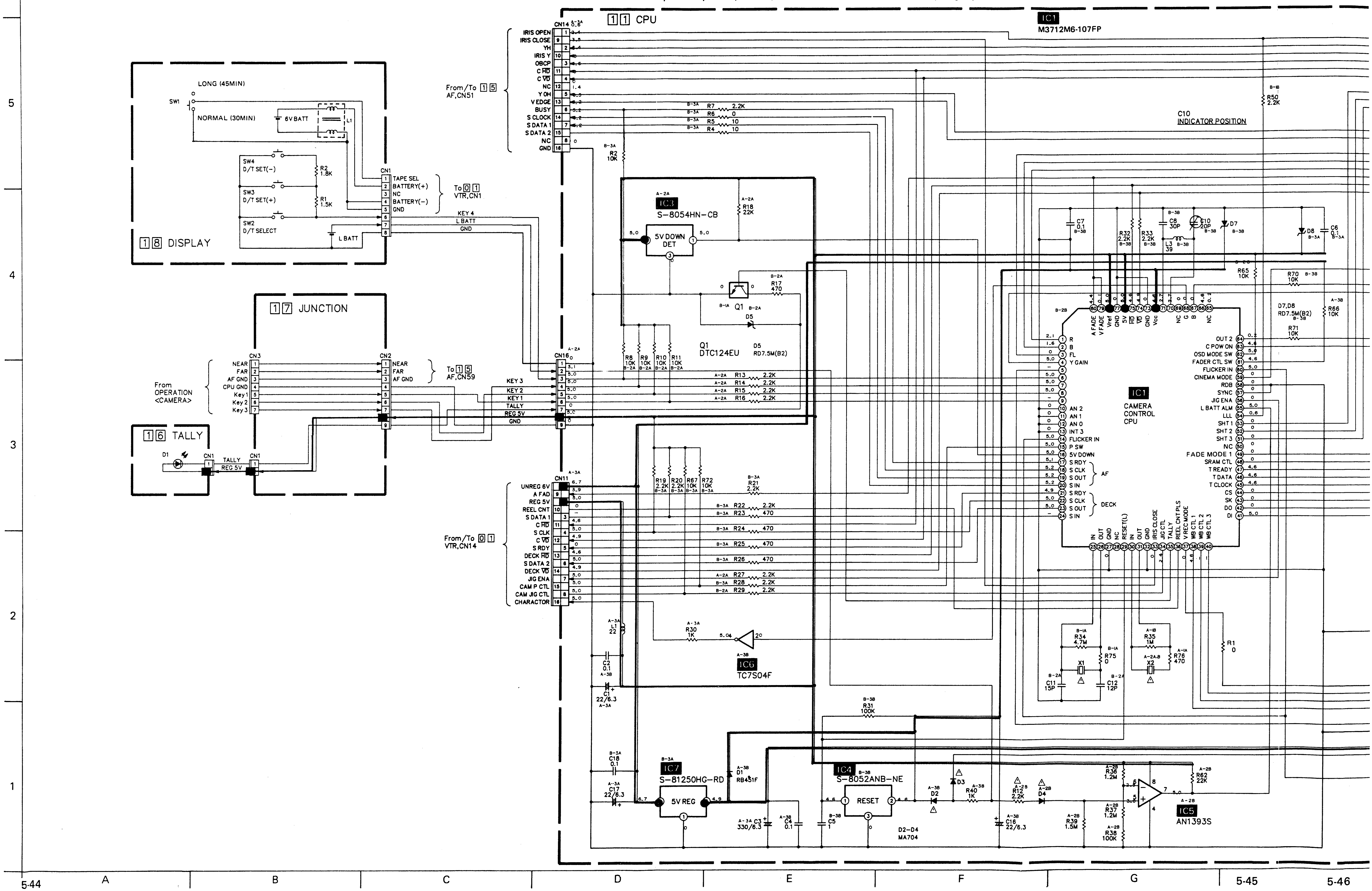
– Front –
(A)



R107
EE LEVEL
R28
GAIN
R24
OFFSET
TP1
HALL AMP OUT
YB20342-01-04
AF PWB ASSY
YB20342C-04
IC3
IC5
IC7
IC1
OSC1
BPF1
BPF2
CN53
CN54
CN55
CN56
CN57
CN58
CN59
CN60
CP1
Q1
D12
L2
L4
L5
1
2
3
4
5
6
A
B

5.22 CPU, DISPLAY, JUNCTION & TALLY SCHEMATIC DIAGRAM

- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.
- Voltage : Measured as the color bar pattern which lighted up brightly is shot in the Rehersal mode.

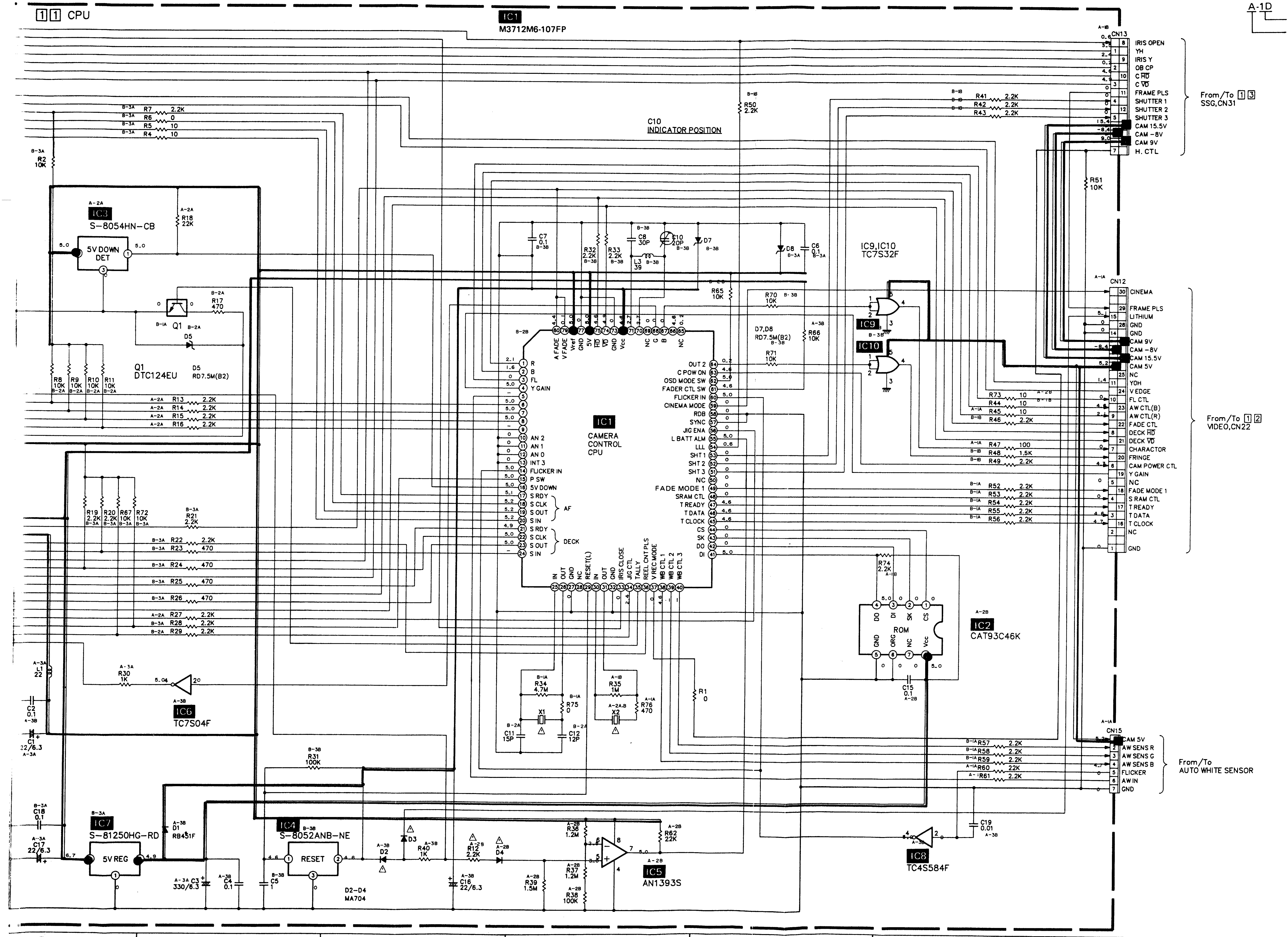


6
5
4
3
2
1
A
B
C
D
E
F
G
1 1 CPU
IC1
M3712M6-107FP
CN14
IRIS OPEN
IRIS CLOSE
YH
IRIS Y
OBCP
C HD
C VD
NC
Y OH
V EDGE
BUSY
S CLOCK
S DATA 1
S DATA 2
NC
GND
From/To 1 5
AF,CN51
R7 2.2K
R6 0
R5 10
R4 10
R2 10K
C10
INDICATOR POSITION
R50 2.2K
1 8 DISPLAY
LONG (45MIN)
SW1
NORMAL (30MIN)
6V BATT
L1
SW4
D/T SET(-)
R2 1.8K
SW3
D/T SET(+)
R1 1.5K
SW2
D/T SELECT
L BATT
CN1
TAPE SEL
BATTERY(+)
NC
BATTERY(-)
GND
To 0 1
VTR,CN1
KEY 4
L BATT
GND
IC3
S-8054HN-CB
5V DOWN DET
R18 22K
R17 470
Q1
D5
Q1 DTC124EU
D5 RD7.5M(B2)
C7 0.1
R32 2.2K
R33 2.2K
C8 30P
C10 20P
D7
D8
C6 0.1
L3 39
R65 10K
R70 10K
D7,D8 RD7.5M(B2)
R66 10K
R71 10K
1 7 JUNCTION
CN3
CN2
NEAR
FAR
AF GND
CPU GND
Key1
Key2
Key3
From OPERATION <CAMERA>
To 1 5
AF,CN59
KEY 3
KEY 2
KEY 1
TALLY
REG 5V
GND
CN16
R8 10K
R9 10K
R10 10K
R11 10K
R13 2.2K
R14 2.2K
R15 2.2K
R16 2.2K
1 6 TALLY
D1
CN1
TALLY
REG 5V
CN1
IC1
CAMERA CONTROL CPU
A FADE
V FADE
Vref
GND
5V
RD
VD
GND
Vcc
NC
G
B
NC
R
B
FL
Y GAIN
AN 2
AN 1
AN 0
INT 3
FLICKER IN
P SW
5V DOWN
S RDY
S CLK
S OUT
S IN
AF
DECK
OUT 2
C POW ON
OSD MODE SW
FADER CTL SW
FLICKER IN
CINEMA MODE
RDB
SYNC
JIG ENA
L BATT ALM
LLL
SHT 1
SHT 2
SHT 3
NC
FADE MODE 1
SRAM CTL
T READY
T DATA
T CLOCK
CS
SK
DO
DI
IN
OUT
GND
NC
RESET(L)
IN
OUT
GND
IRIS CLOSE
JIG CTL
TALLY
REEL CNT PLS
V REC MODE
WB CTL 1
WB CTL 2
WB CTL 3
CN11
UNREG 6V
A FAD
REG 5V
REEL CNT
S DATA 1
C HD
S CLK
C VD
S RDY
DECK HD
S DATA 2
DECK VD
JIG ENA
CAM P CTL
CAM JIG CTL
CHARACTOR
From/To 0 1
VTR,CN14
R19 2.2K
R20 2.2K
R67 10K
R72 10K
R21 2.2K
R22 2.2K
R23 470
R24 470
R25 470
R26 470
R27 2.2K
R28 2.2K
R29 2.2K
L1 22
C2 0.1
C1 22/6.3
R30 1K
IC6
TC7S04F
R34 4.7M
X1
R75 0
C11 15P
C12 12P
R35 1M
X2
R76 470
R1 0
R31 100K
C18 0.1
C17 22/6.3
IC7
S-81250HG-RD
5V REG
D1 RB431F
C3 330/6.3
C4 0.1
IC4
S-8052ANB-NE
RESET
C5 1
D2
D3
D2-D4 MA704
R40 1K
R12 2.2K
D4
C16 22/6.3
R39 1.5M
R36 1.2M
R37 1.2M
R38 100K
R62 22K
IC5
AN1393S

- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.
- Voltage : Measured as the color bar pattern which lighted up brightly is shot in the Rehersal mode.

- Address of chip parts

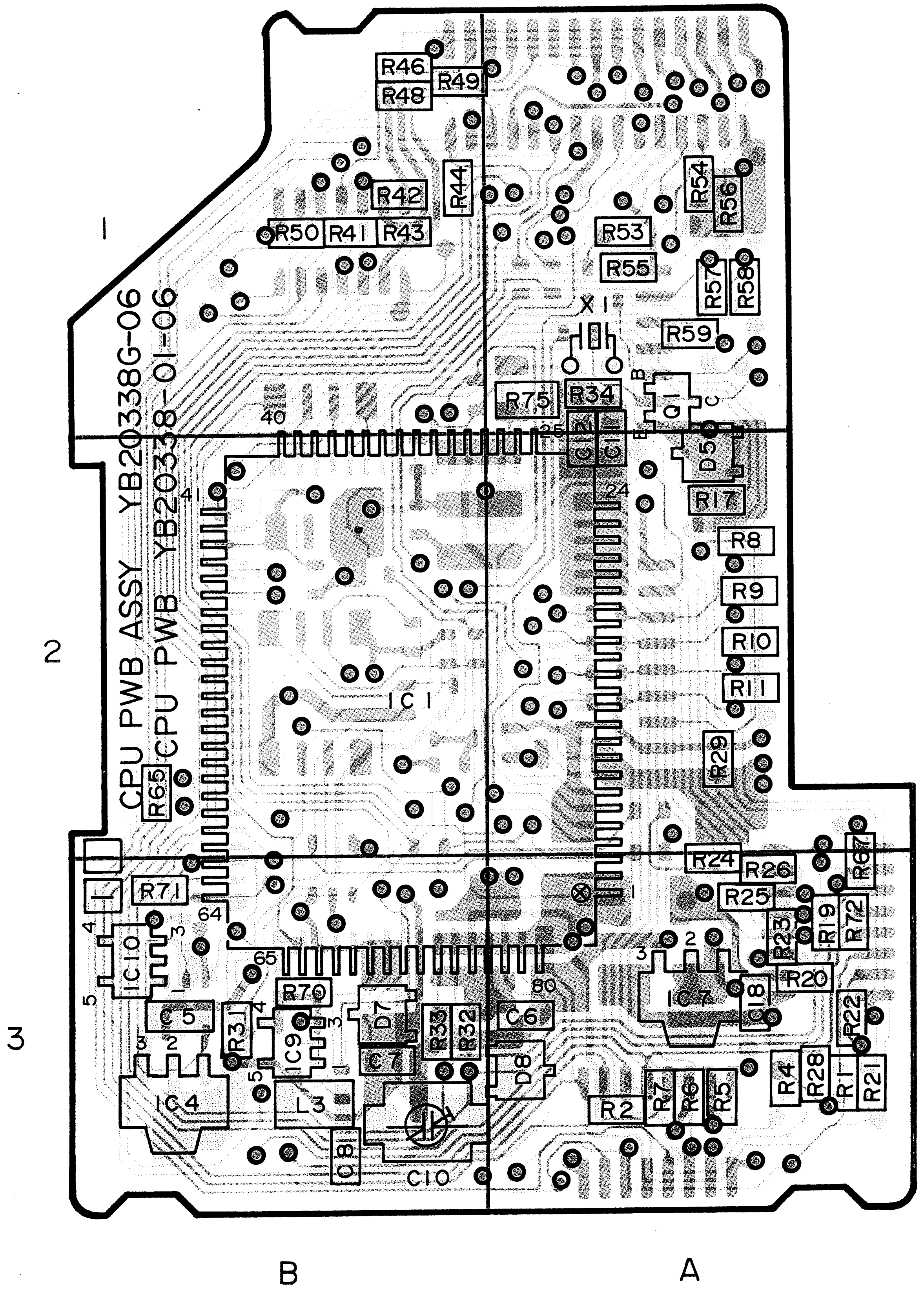
A-1D
Address
A : Discrete parts side
B : Chip parts side


1 1 CPU
IC1
M3712M6-107FP
IC1 CAMERA CONTROL CPU
IC3 S-8054HN-CB
5V DOWN DET
Q1 DTC124EU
D5 RD7.5M(B2)
IC2 CAT93C46K
ROM
IC9,IC10 TC7S32F
IC6 TC7S04F
IC7 S-81250HG-RD
5V REG
IC4 S-8052ANB-NE
RESET
IC5 AN1393S
IC8 TC4S584F
D1 RB451F
D2-D4 MA704
D7,D8 RD7.5M(B2)
C10 INDICATOR POSITION
CN13
IRIS OPEN
YH
IRIS Y
OB CP
C HD
C VD
FRAME PLS
SHUTTER 1
SHUTTER 2
SHUTTER 3
CAM 15.5V
CAM -8V
CAM 9V
H. CTL
From/To 1 3 SSG,CN31
CN12
CINEMA
FRAME PLS
LITHIUM
GND
GND
CAM 9V
CAM -8V
CAM 15.5V
CAM 5V
NC
YOH
V EDGE
FL CTL
AW CTL(B)
AW CTL(R)
FADE CTL
DECK HD
DECK VD
CHARACTOR
FRINGE
CAM POWER CTL
Y GAIN
NC
FADE MODE 1
S RAM CTL
T READY
T DATA
T CLOCK
NC
GND
From/To 1 2 VIDEO,CN22
CN15
CAM 5V
AW SENS R
AW SENS G
AW SENS B
FLICKER
AW IN
GND
From/To AUTO WHITE SENSOR
R B FL Y GAIN AN 2 AN 1 AN 0 INT 3 FLICKER IN P SW 5V DOWN
S RDY S CLK S OUT S IN AF
S RDY S CLK S OUT S IN DECK
OUT 2 C POW ON OSD MODE SW FADER CTL SW FLICKER IN CINEMA MODE RDB SYNC JIG ENA L BATT ALM LLL SHT 1 SHT 2 SHT 3 NC FADE MODE 1 SRAM CTL T READY T DATA T CLOCK CS SK DO DI
A FADE V FADE Vref GND 5V HD VD GND Vcc NC G B NC
IN OUT GND NC RESET(L) IN OUT GND IRIS CLOSE JIG CTL TALLY REEL CNT PLS V REC MODE WB CTL 1 WB CTL 2 WB CTL 3
DO DI SK CS GND ORG NC Vcc
X1 X2
R2 10K
R4 10 R5 10 R6 0 R7 2.2K
R8 10K R9 10K R10 10K R11 10K
R13 2.2K R14 2.2K R15 2.2K R16 2.2K
R17 470 R18 22K
R19 2.2K R20 2.2K R67 10K R72 10K R21 2.2K
R22 2.2K R23 470 R24 470 R25 470 R26 470
R27 2.2K R28 2.2K R29 2.2K
R30 1K R31 100K
R32 2.2K R33 2.2K L3 39
R34 4.7M R75 0 R35 1M R76 470
R36 1.2M R37 1.2M R38 100K R39 1.5M R40 1K R12 2.2K R62 22K
R41 2.2K R42 2.2K R43 2.2K R50 2.2K R51 10K
R65 10K R66 10K R70 10K R71 10K R74 2.2K R1 0
R44 10 R45 10 R46 2.2K R47 100 R48 1.5K R49 2.2K R73 10
R52 2.2K R53 2.2K R54 2.2K R55 2.2K R56 2.2K
R57 2.2K R58 2.2K R59 2.2K R60 22K R61 2.2K
C1 22/6.3 C2 0.1 L1 22 C3 330/6.3 C4 0.1 C5 1
C6 0.1 C7 0.1 C8 30P C10 20P C11 15P C12 12P C15 0.1
C16 22/6.3 C17 22/6.3 C18 0.1 C19 0.01

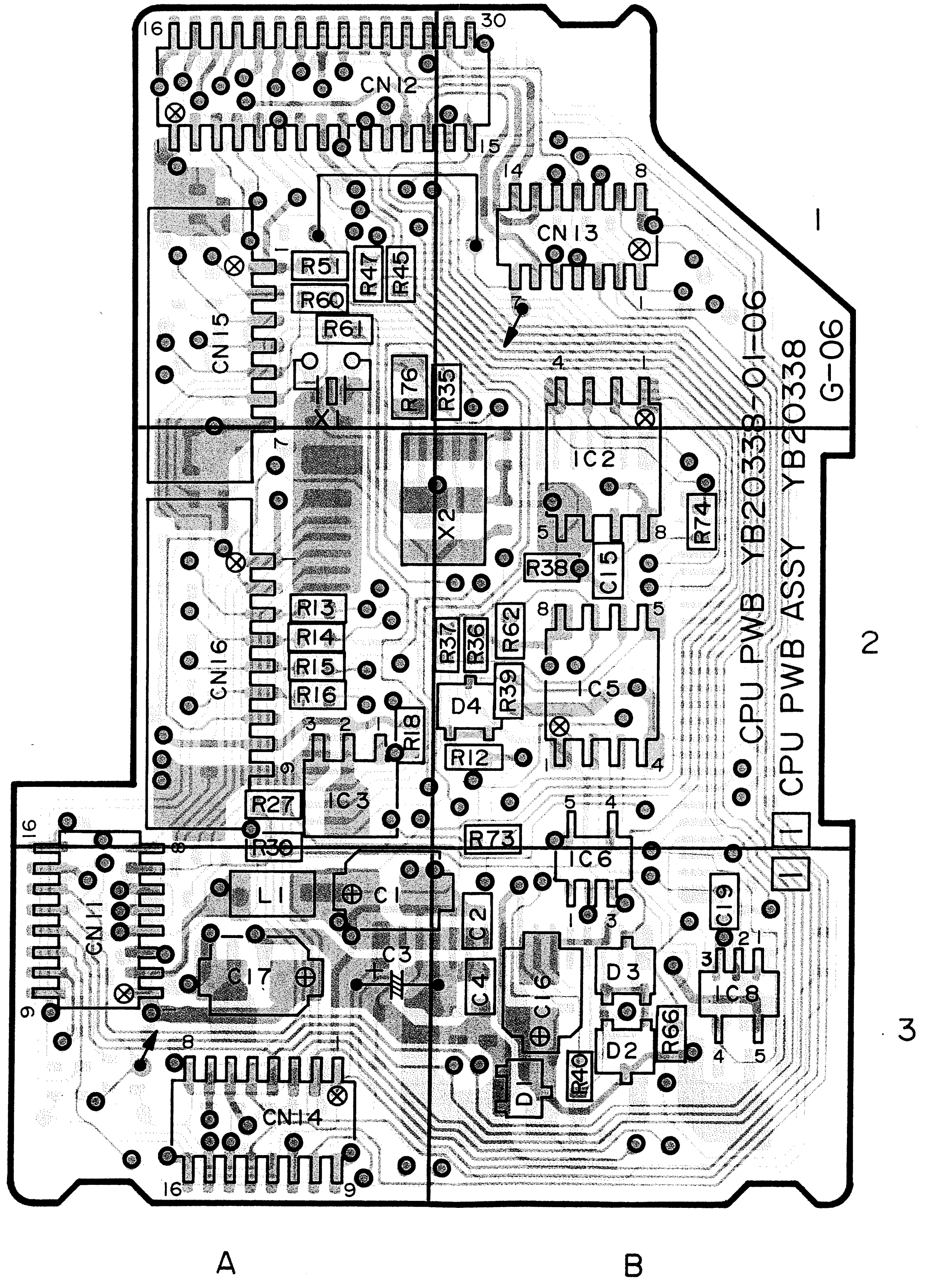
D E F G I J K

5.23 CPU, DISPLAY, JUNCTION & TALLY CIRCUIT BOARD

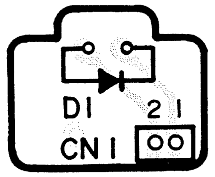
— Rear —
(B)


CPU PWB ASSY YB20338G-06
CPU PWB YB20338-01-06
R46
R48
R49
R42
R44
R50
R41
R43
R53
R55
R54
R56
R57
R58
X1
R59
R75
R34
Q1
D5
C12
C11
R17
R8
R9
R10
R11
R29
IC1
R65
R71
IC10
C5
R3
IC9
R70
D7
C7
R33
R32
C6
D8
IC4
L3
C8
C10
IC7
C18
R24
R26
R25
R67
R19
R72
R23
R20
R22
R28
R4
R1
R21
R2
R7
R6
R5
40
41
25
24
64
65
80
1
2
3
B
A

— Front —
(A)

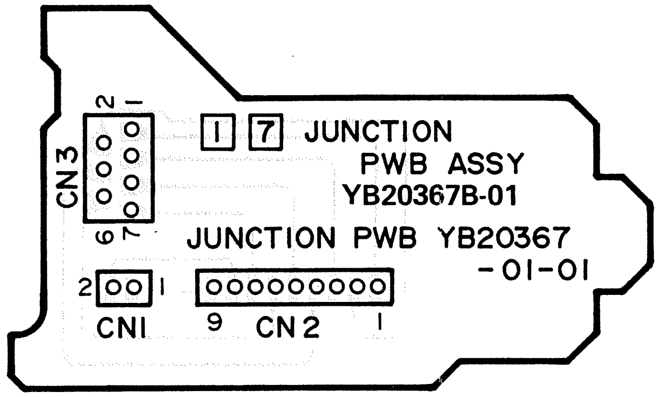

CPU PWB YB20338-01-06
CPU PWB ASSY YB20338G-06
CN12
16
30
15
CN13
14
8
CN15
R51
R60
R47
R45
R61
X1
R76
R35
IC2
X2
R74
R38
C15
CN16
R13
R14
R15
R16
R37
R36
R62
D4
R39
IC5
R18
R12
IC3
R27
R30
R73
IC6
CN11
L1
C1
C2
C3
C17
C4
C16
D3
C19
IC8
D2
R66
D1
R40
CN14
9
1
2
3
A
B

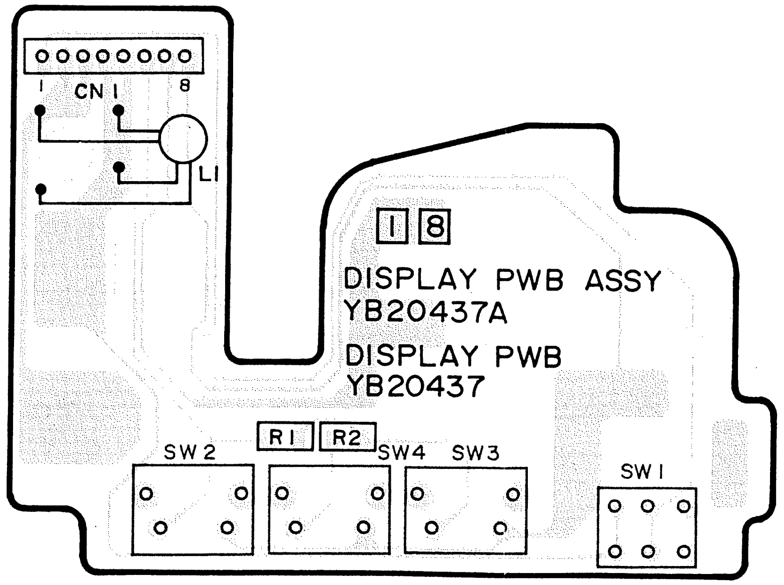
– TALLY –



1 6 TALLY PWB ASSY
YB20366B
TALLY PWB
YB20366

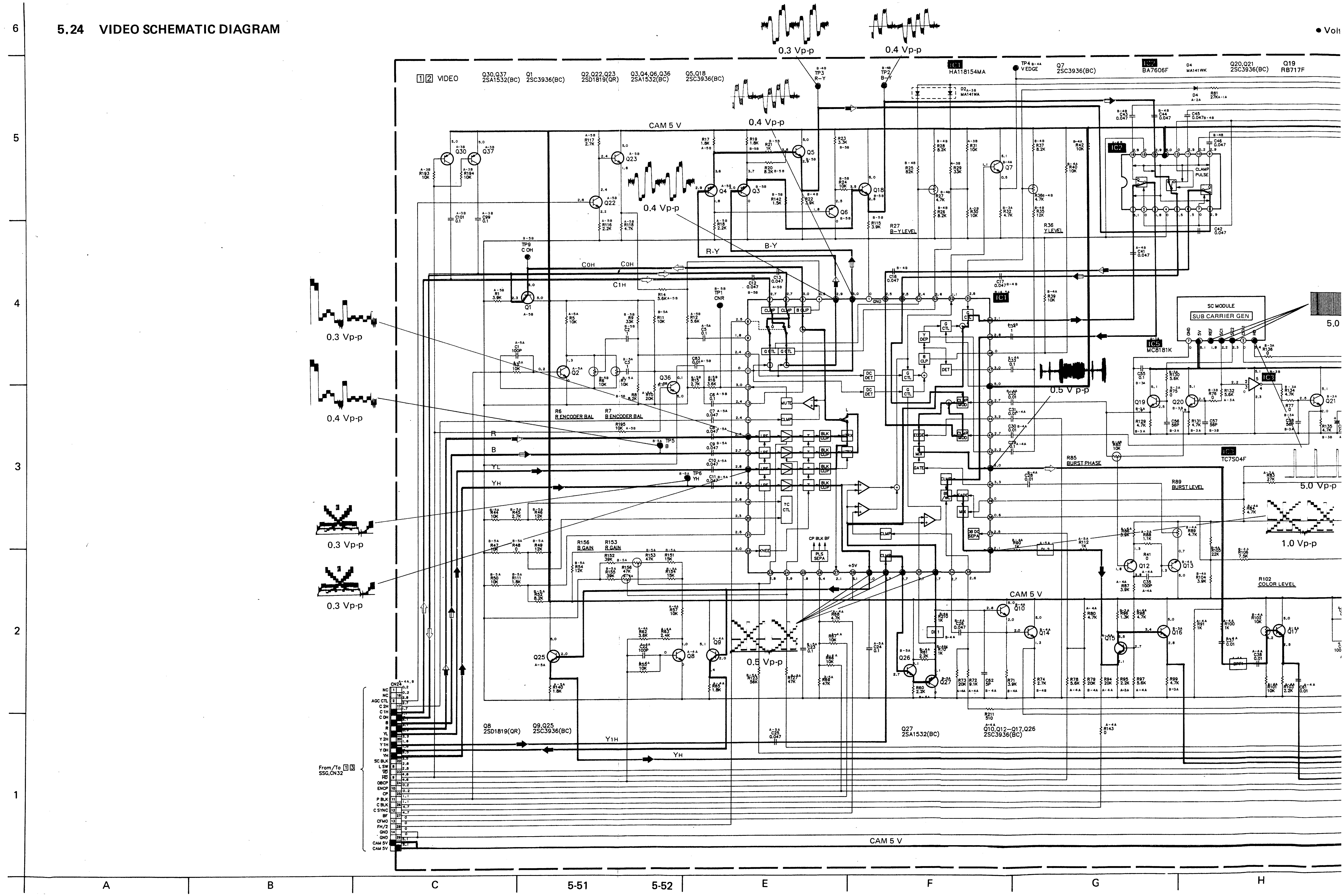
– JUNCTION –


CN3
2 1
6 7
1 7 JUNCTION
PWB ASSY
YB20367B-01
JUNCTION PWB YB20367
-01-01
2 1
CN1
9 CN 2 1


1 CN 1 8
L1
1 8
DISPLAY PWB ASSY
YB20437A
DISPLAY PWB
YB20437
R1
R2
SW 2
SW4
SW3
SW 1

5.24 VIDEO SCHEMATIC DIAGRAM

● Volt



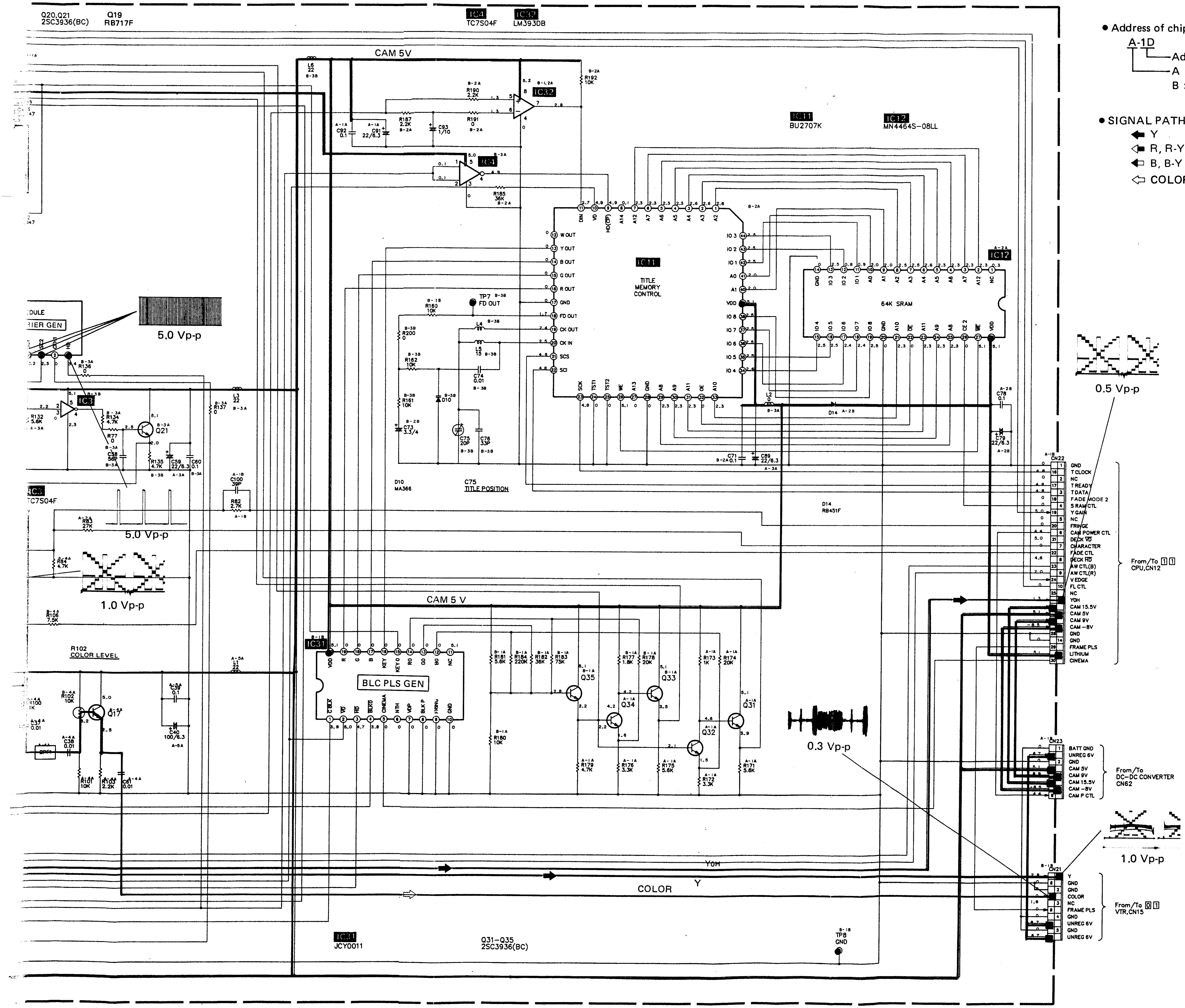
6
5
4
3
2
1
A
B
C
E
F
G
H
1 2 VIDEO
Q30,Q37 2SA1532(BC)
Q1 2SC3936(BC)
Q2,Q22,Q23 2SD1819(QR)
Q3,Q4,Q6,Q36 2SA1532(BC)
Q5,Q18 2SC3936(BC)
IC1 HA118154MA
TP4 VEDGE
Q7 2SC3936(BC)
IC2 BA7606F
D4 MA141WK
Q20,Q21 2SC3936(BC)
Q19 RB717F
0.3 Vp-p
0.4 Vp-p
0.4 Vp-p
0.4 Vp-p
TP3 R-Y
TP2 B-Y
CAM 5 V
R27 B-Y LEVEL
R36 Y LEVEL
R-Y
B-Y
TP9 C OH
COH
C1H
TP1 CNR
CLAMP PULSE
SC MODULE
SUB CARRIER GEN
IC5 MC6181K
IC3
IC4 TC7S04F
5.0
0.3 Vp-p
0.4 Vp-p
0.3 Vp-p
0.3 Vp-p
0.5 V p-p
R6 R ENCODER BAL
R7 B ENCODER BAL
TP5 B
TP6 YH
R
B
YL
YH
R156 B GAIN
R153 R GAIN
R85 BURST PHASE
R89 BURST LEVEL
5.0 Vp-p
1.0 Vp-p
R102 COLOR LEVEL
CAM 5 V
0.5 Vp-p
CP BLK BF
PLS SEPA
+5V
Q8 2SD1819(QR)
Q9,Q25 2SC3936(BC)
Q27 2SA1532(BC)
Q10,Q12–Q17,Q26 2SC3936(BC)
Y1H
YH
From/To 1 3 SSG,CN32
CN24
NC
NC
AGC CTL
C 2H
C 1H
C OH
B
R
YL
Y 2H
Y 1H
Y OH
YH
SC BLK
L SW
VD
HD
OBCP
ENCP
CP
P BLK
C BLK
C SYNC
BF
CFMO
FH/2
GND
GND
CAM 5V
CAM 5V
CAM 5 V
5-51
5-52

- Voltage : Measured as the color bar pattern which lighted up brightly is shot in the Rehersal mode.

- Waveform : Measured as the grey scale pattern or color bar pattern which lighted up brightly is shot in the Rehersal mode.

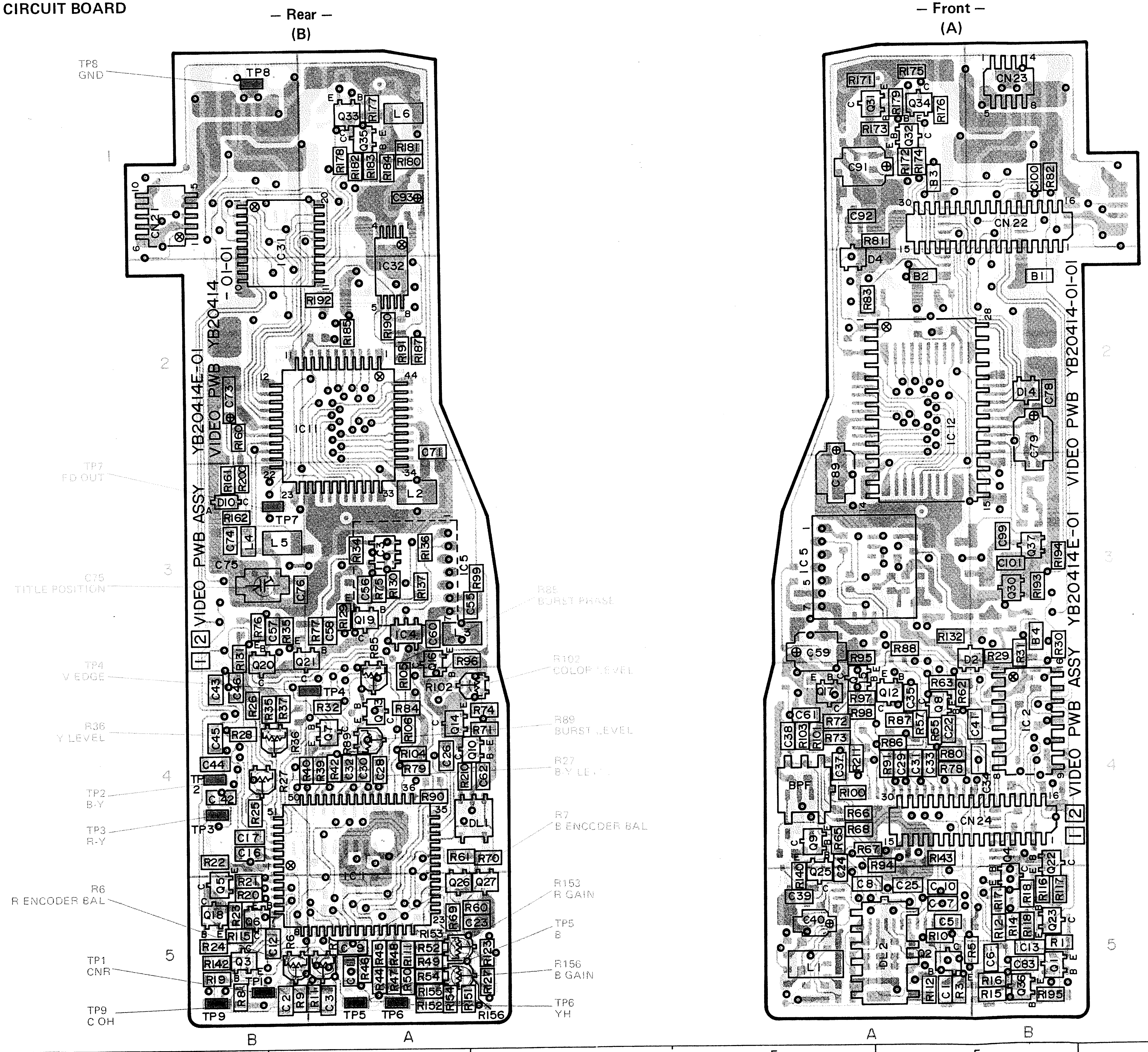
- Address of chip parts
  A-1D
  Address
  A : Discrete parts side
  B : Chip parts side

- SIGNAL PATH
  - ← Y
  - ⇐ R, R-Y
  - ← B, B-Y
  - ⇐ COLOR



Q20,Q21
2SC3936(BC)
Q19
RB717F
IC4
TC7S04F
IC32
LM393DB
IC11
BU2707K
IC12
MN4464S-08LL
CAM 5V
TITLE MEMORY CONTROL
64K SRAM
W OUT
Y OUT
B OUT
G OUT
R OUT
GND
FD OUT
CK OUT
CK IN
SCS
SCI
TP7 FD OUT
D10
MA366
C75
TITLE POSITION
D14
RB451F
5.0 Vp-p
5.0 Vp-p
1.0 Vp-p
0.5 Vp-p
0.3 Vp-p
1.0 Vp-p
IC3
TC7S04F
R102
COLOR LEVEL
CAM 5 V
IC31
BLC PLS GEN
Q31
Q32
Q33
Q34
Q35
Q17
Q21
IC31
JCY0011
Q31-Q35
2SC3936(BC)
TP8
GND
YOH
Y
COLOR
CN22
GND
T CLOCK
NC
T READY
T DATA
FADE MODE 2
S RAM CTL
Y GAIN
NC
FRINGE
CAM POWER CTL
DECK VD
CHARACTER
FADE CTL
DECK HD
AW CTL(B)
AW CTL(R)
VEDGE
FL CTL
NC
YOH
CAM 15.5V
CAM 5V
CAM 9V
CAM -8V
GND
GND
FRAME PLS
LITHIUM
CINEMA
From/To CPU,CN12
CN23
BATT GND
UNREG 6V
GND
CAM 5V
CAM 9V
CAM 15.5V
CAM -8V
CAM P CTL
From/To DC-DC CONVERTER CN62
CN21
Y
GND
GND
COLOR
NC
FRAME PLS
GND
UNREG 6V
GND
UNREG 6V
From/To VTR,CN15
H
I
J
K
M
N
O

5.25 VIDEO CIRCUIT BOARD


– Rear –
(B)

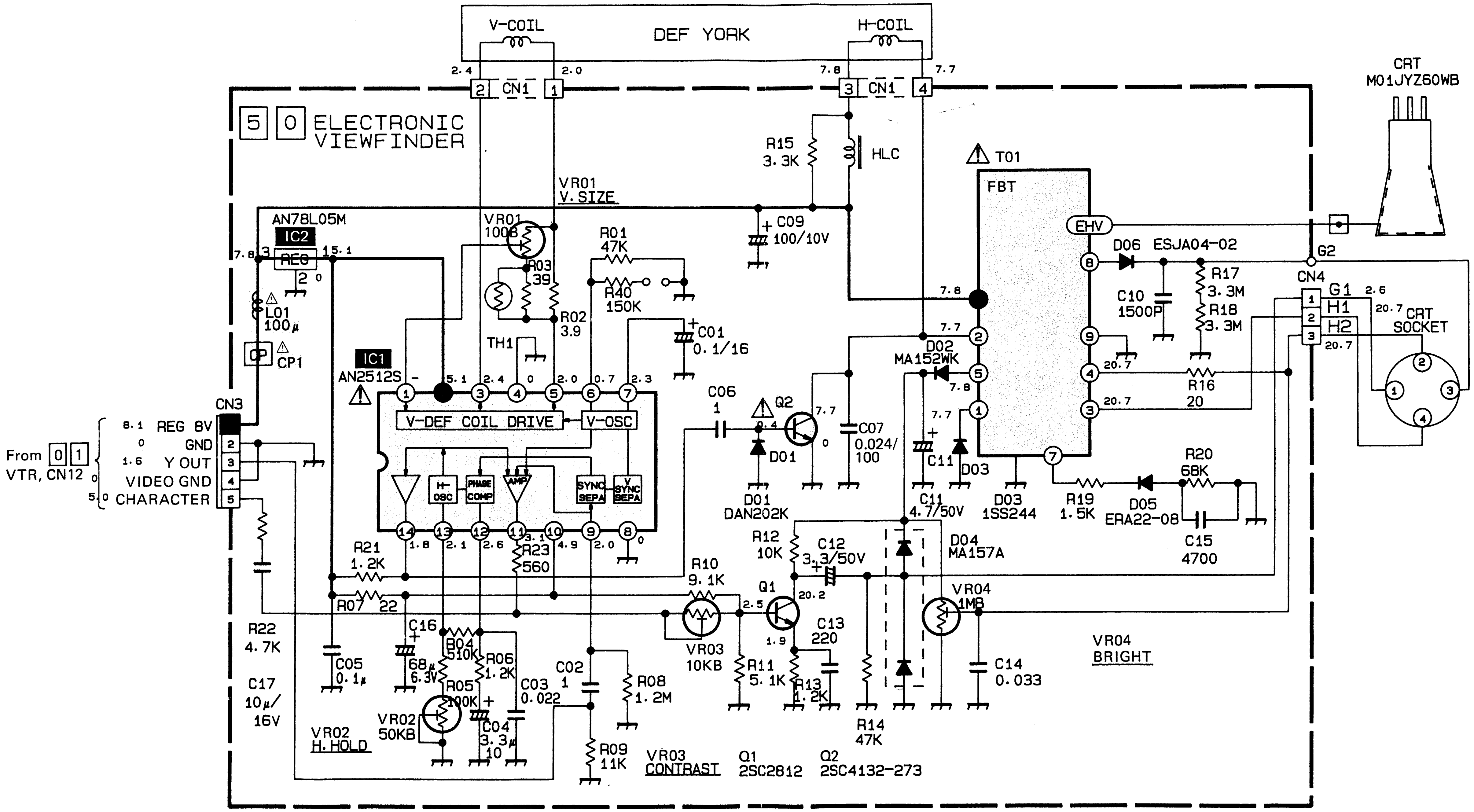
– Front –
(A)

TP8 GND
TP7 FD OUT
C75 TITLE POSITION
TP4 V EDGE
R36 Y LEVEL
TP2 B-Y
TP3 R-Y
R6 R ENCODER BAL
TP1 CNR
TP9 C OH
R85 BURST PHASE
R102 COLOR LEVEL
R89 BURST LEVEL
R27 B-Y LE
R7 B ENCODER BAL
R153 R GAIN
TP5 B
R156 B GAIN
TP6 YH
VIDEO PWB ASSY YB20414E-01
VIDEO PWB YB20414-01-01
IC31
IC32
IC11
IC5
IC4
IC1
IC12
IC2
CN21
CN22
CN23
CN24
L2
L4
L5
L6
DL1
DL2
BPF
B
A

CS 35 386

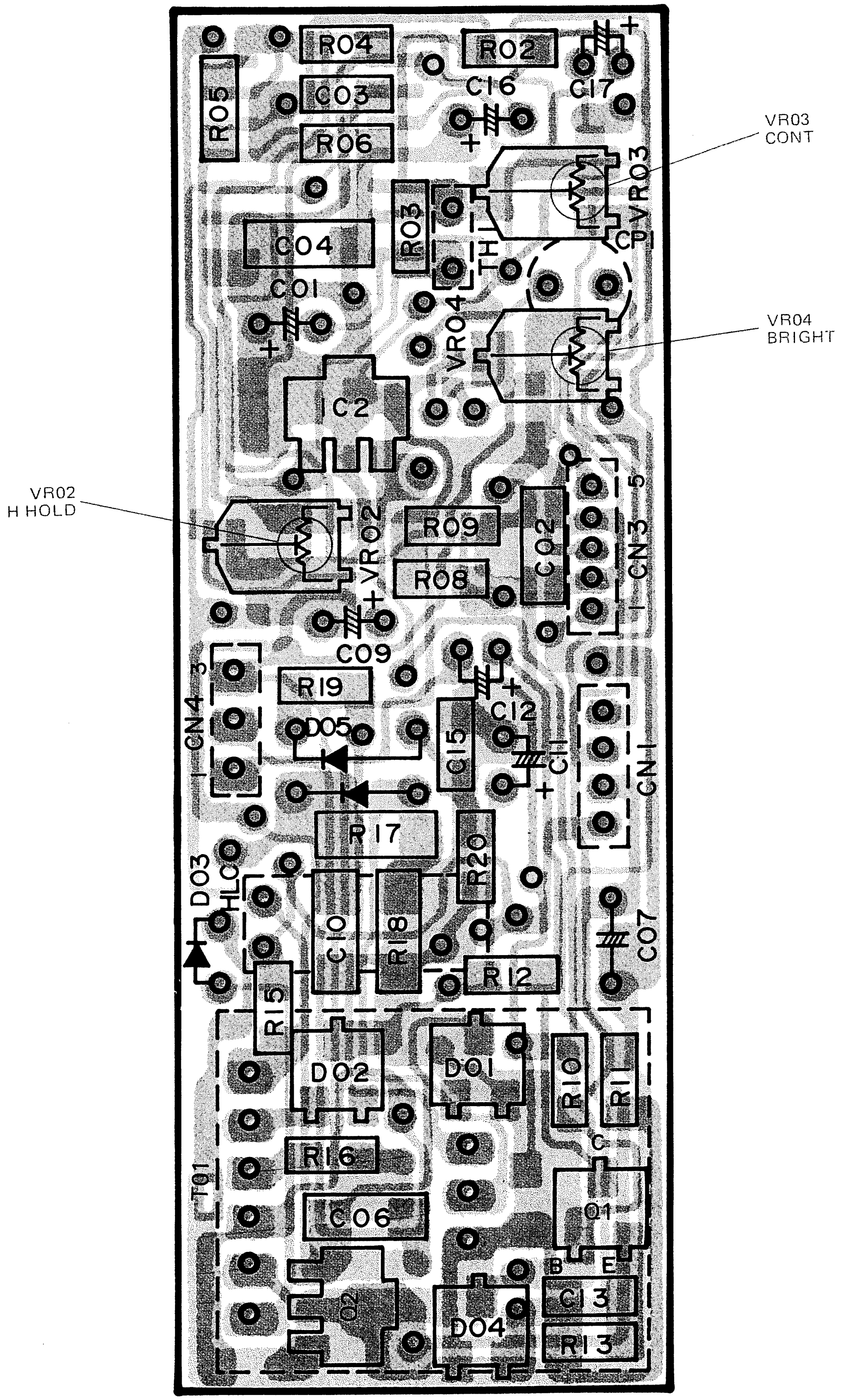
5.26 ELECTRONIC VIEW FINDER SCHEMATIC DIAGRAM

- Shaded (▒) parts are critical for safety. Replace only with specified part numbers.

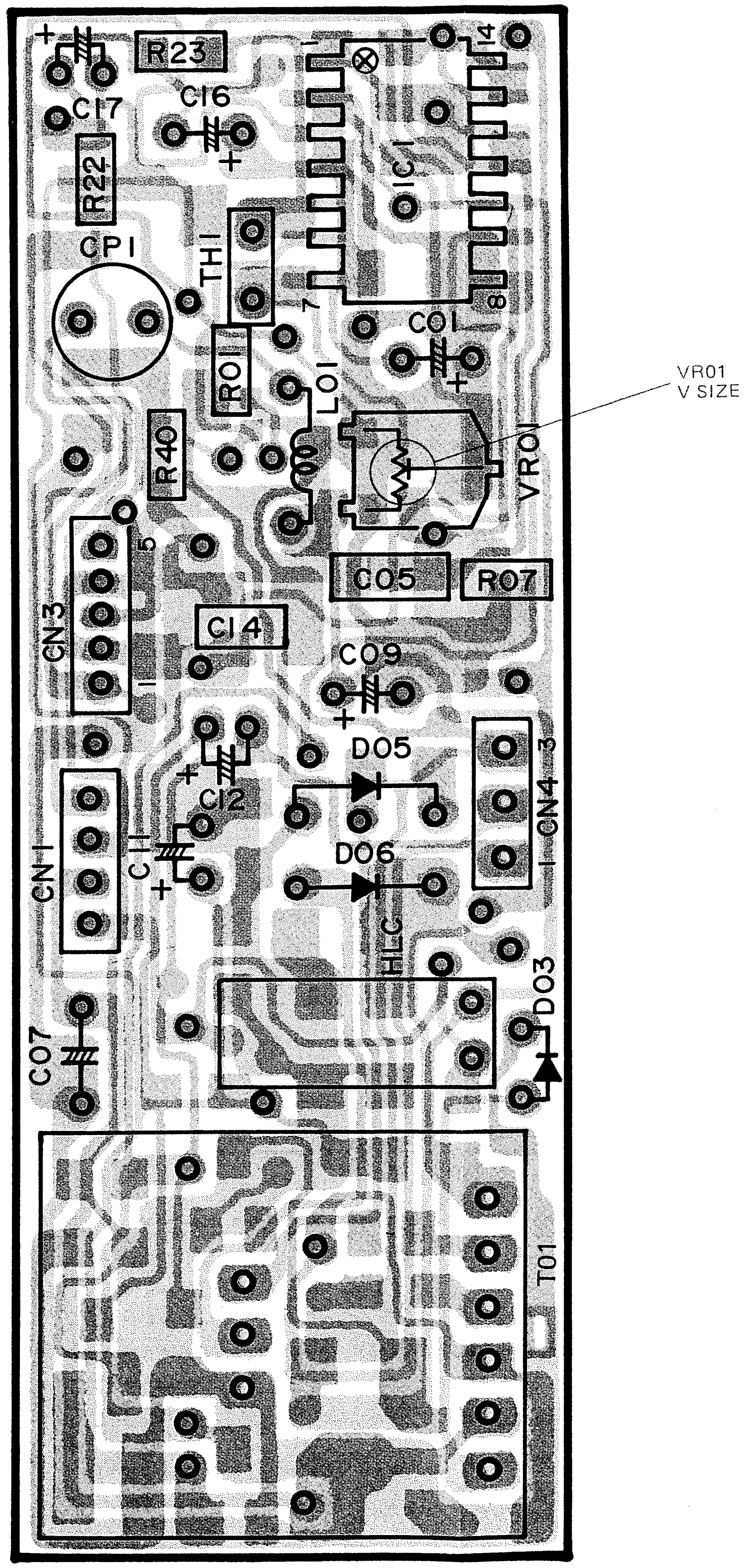

DEF YORK
V-COIL
H-COIL
CN1
5 0 ELECTRONIC VIEWFINDER
AN78L05M
IC2
REG
L01 100µ
CP1
IC1
AN2512S
V-DEF COIL DRIVE
V-OSC
H-OSC
PHASE COMP
AMP
SYNC SEPA
V SYNC SEPA
VR01 V.SIZE
VR01 100B
R03 39
R02 3.9
TH1
R01 47K
R40 150K
C01 0.1/16
R15 3.3K
HLC
C09 100/10V
T01
FBT
EHV
D06 ESJA04-02
C10 1500P
R17 3.3M
R18 3.3M
R16 20
G2
CN4
G1
H1
H2
CRT SOCKET
CRT M01JYZ60WB
D02 MA152WK
C06 1
Q2
D01
C07 0.024/100
C11
D03
D01 DAN202K
C11 4.7/50V
D03 1SS244
R19 1.5K
D05 ERA22-08
R20 68K
C15 4700
R12 10K
C12 3.3/50V
D04 MA157A
VR04 1MB
VR04 BRIGHT
R10 9.1K
Q1
VR03 10KB
R11 5.1K
R13 1.2K
C13 220
R14 47K
C14 0.033
R21 1.2K
R07 22
R23 560
C16
R04 510K
R06 1.2K
C05 0.1µ
68µ 6.3V
R05 100K
VR02 50KB
C04 3.3µ 10
C03 0.022
C02 1
R08 1.2M
R09 11K
R22 4.7K
C17 10µ/16V
VR02 H.HOLD
VR03 CONTRAST
Q1 2SC2812
Q2 2SC4132-273
CN3
REG 8V
GND
Y OUT
VIDEO GND
CHARACTER
From 0 1 VTR, CN12

5.27 ELECTRONIC VIEW FINDER CIRCUIT BOARD

– Rear –
(B)


VR03
CONT
VR04
BRIGHT
VR02
H HOLD
R04
R02
R05
C03
C16
C17
R06
R03
VR03
C04
TH1
CP1
C01
VR04
IC2
VR02
R09
C02
CN3
R08
C09
CN4
R19
D05
C12
C15
C11
CN1
R17
R20
D03
HLC
C10
R18
C07
R12
R15
D02
D01
R10
R11
R16
T01
C06
Q1
B
C
E
Q2
D04
C13
R13

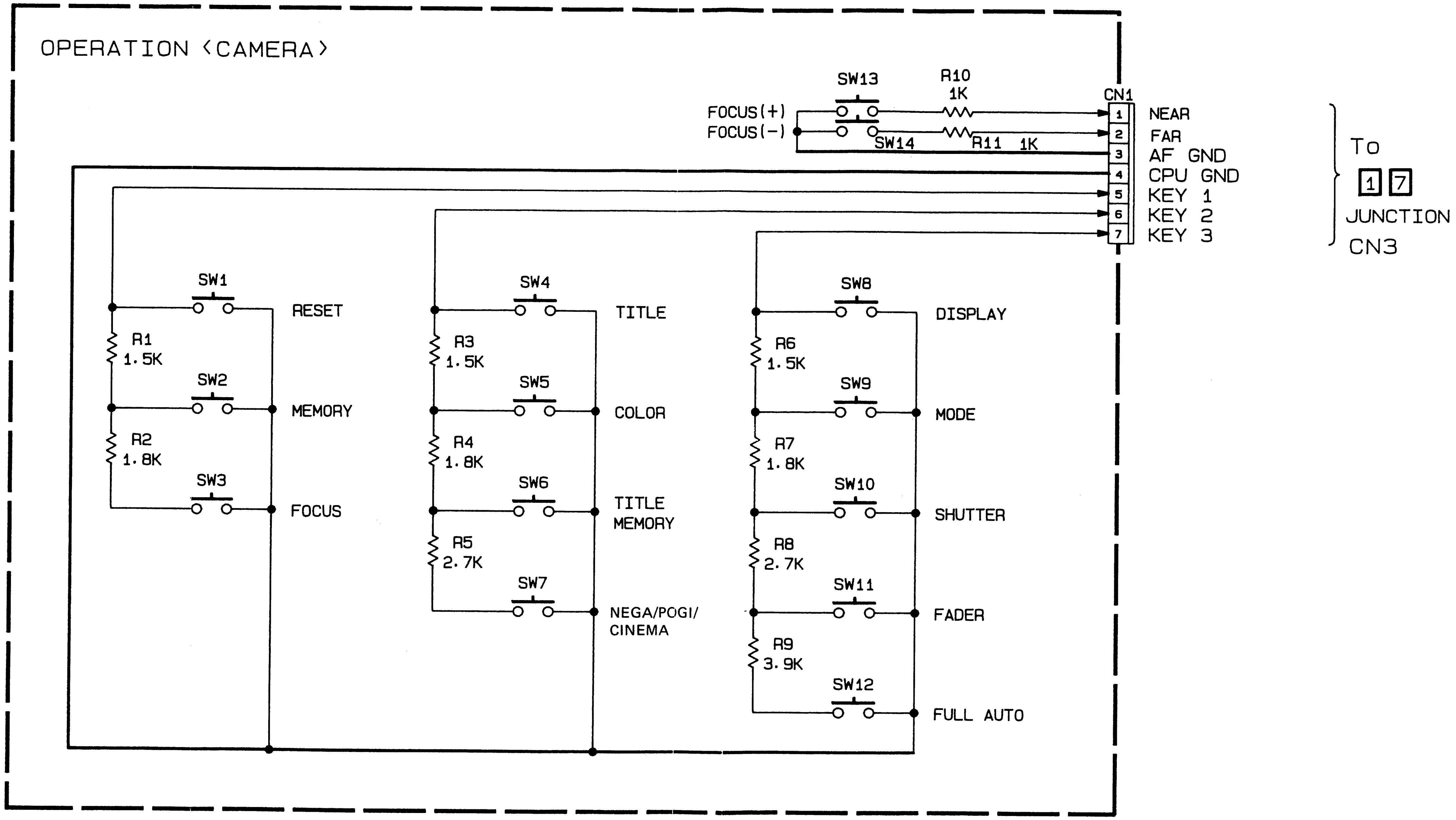
– Front –
(A)


VR01
V SIZE
R23
C17
C16
IC1
14
7
8
R22
CP1
TH1
C01
R01
L01
R40
VR01
CN3
C05
R07
C14
C09
D05
C12
CN4
CN1
C11
D06
HLC
D03
C07
T01

CS 35 388

5.28 OPERATION (CAMERA) SCHEMATIC DIAGRAM

NOTE: This schematic diagram is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

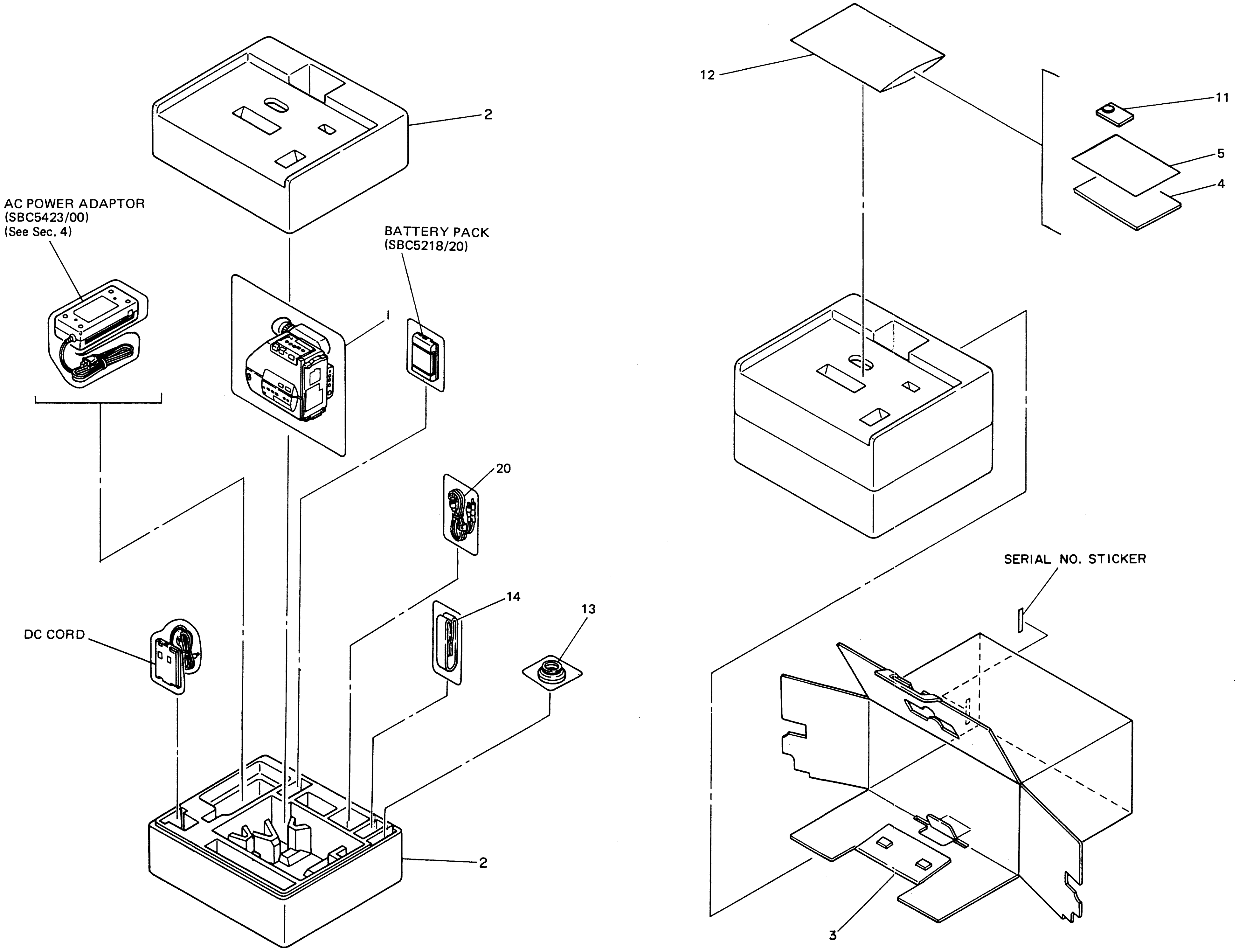

OPERATION ⟨CAMERA⟩
FOCUS(+)
FOCUS(−)
SW13
SW14
R10 1K
R11 1K
CN1
1 NEAR
2 FAR
3 AF GND
4 CPU GND
5 KEY 1
6 KEY 2
7 KEY 3
To 1 7 JUNCTION CN3
SW1 RESET
SW2 MEMORY
SW3 FOCUS
R1 1.5K
R2 1.8K
SW4 TITLE
SW5 COLOR
SW6 TITLE MEMORY
SW7 NEGA/POGI/ CINEMA
R3 1.5K
R4 1.8K
R5 2.7K
SW8 DISPLAY
SW9 MODE
SW10 SHUTTER
SW11 FADER
SW12 FULL AUTO
R6 1.5K
R7 1.8K
R8 2.7K
R9 3.9K

SECTION 6
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION
Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

NOTE: <M >indicates mechanical symbol number.

6.1 PACKING ASSEMBLY <M1>


12
2
11
5
4
AC POWER ADAPTOR
(SBC5423/00)
(See Sec. 4)
BATTERY PACK
(SBC5218/20)
1
20
14
13
DC CORD
2
SERIAL NO. STICKER
3

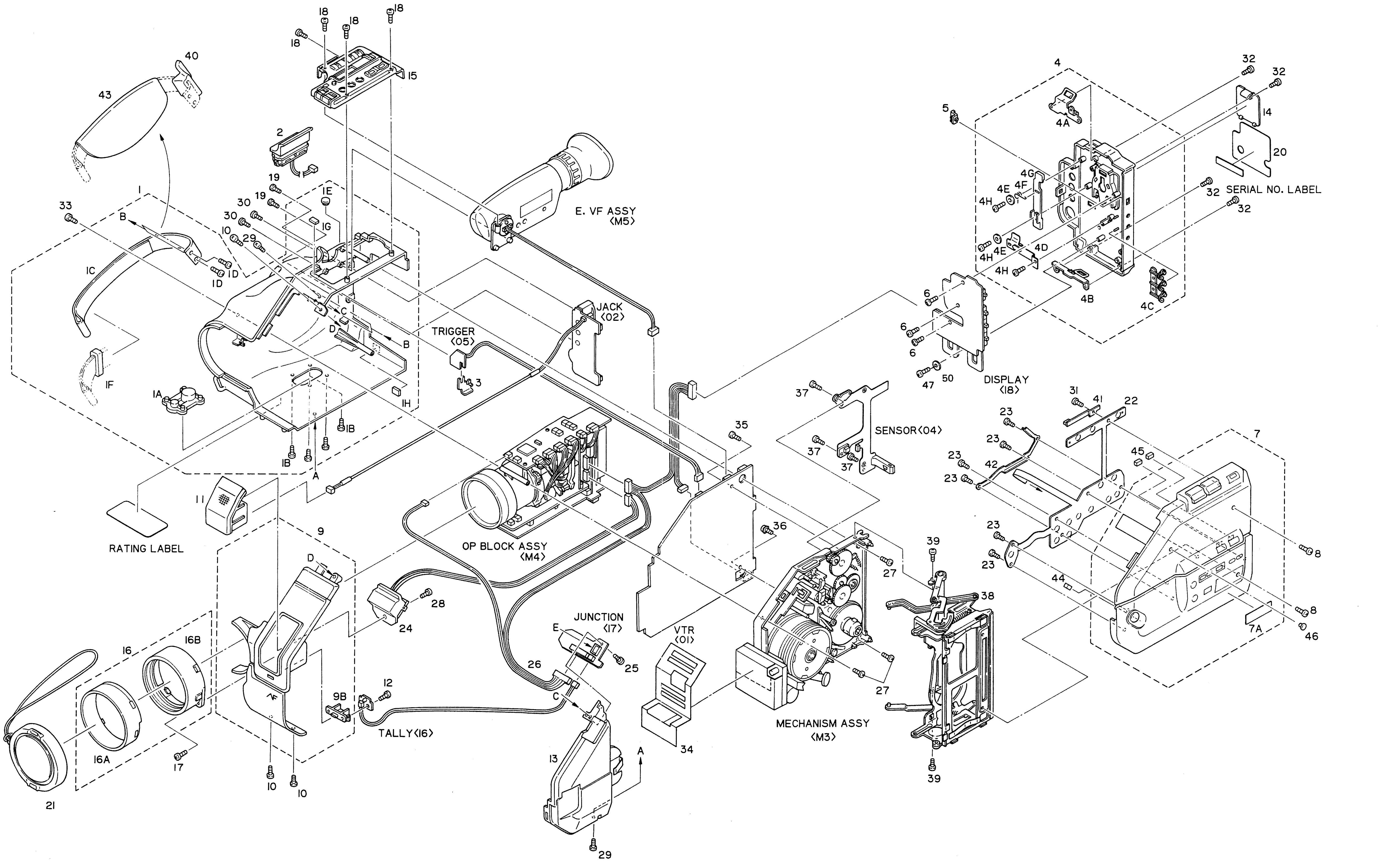
PACKING ASSEMBLY (M1)

Pos.	Parts code	Description
4	4822 736 52396	INSTRUCTIONS
11	4822 138 10272	BATTERY
13	4822 532 21436	SET UP RING
14	4822 498 20119	SHOULDER STRAP ASSY
20	4822 321 23705	AV CABLE ASSY

DEVIATING PARTS FOR 68VKR70/40 (M1)

Pos.	Parts code	Description
4	4822 736 52412	INSTRUCTION /01
14	4822 498 20121	SHOULDER STRAP ASSY /01
20	4822 321 22334	AV CABLE ASSY/01

6.2 FINAL ASSEMBLY <M2>


18
18
18
18
15
40
43
2
19
19
1E
1G
30
30
10
29
33
B
1
1C
1D
1D
C
D
B
1F
1A
1B
1B
1H
A
E. VF ASSY
<M5>
JACK
<02>
TRIGGER
<05>
3
11
RATING LABEL
9
D
OP BLOCK ASSY
<M4>
24
28
16
16B
16A
17
10
10
21
9B
12
TALLY<16>
JUNCTION
<17>
E
25
26
C
13
A
29
VTR
<01>
34
35
36
27
27
MECHANISM ASSY
<M3>
39
38
39
37
37
37
SENSOR<04>
4
4A
5
4G
4E
4F
4H
4H
4E
4D
4H
4B
4C
32
32
14
20
32
SERIAL NO. LABEL
32
6
6
6
47
50
DISPLAY
<18>
31
41
22
23
23
23
42
23
45
7
23
23
44
8
8
46
7A

FINAL ASSEMBLY (M2)

Pos.	Parts code	Description
1	4822 432 60536	LOWER CASE ASSY
1C	4822 498 30182	GRIP BELT
2	4822 276 13068	ZOOM SWITCH
3	4822 403 70357	PWB HOLDER
4	4822 432 60539	REAR COVER ASSY
5	4822 410 61153	KNOB (TIME)
7	4822 432 60537	CASSETTE COVER ASSY
8	4822 502 60122	SPECIAL SCREW,X2
9	4822 432 60538	FRONT PANEL ASSY
11	4822 242 30231	MICROPHONE
13	4822 432 60542	UPPER COVER ASSY
14	4822 443 63272	CLOCK BATTERY COVER
15	4822 276 80412	OPERATION UNIT
16A	4822 532 61198	HOOD
16B	4822 532 61197	RING
20	4822 466 62036	BATTERY BASE SHEET
21	4822 462 41797	HOOD CAP ASSY
22	4822 466 10604	OPERATION PWB
24	4822 691 20655	WHITE BALANCE SENSOR
26	4822 321 61155	CPU PWB WIRE
38	4822 691 20654	HOUSING ASSY
40	4822 403 70352	FINGER REST
42	4822 403 70353	PWB HOLDER
43	4822 466 40613	GRIP PAD
46	4822 462 71559	CAP
50	4822 532 12069	SLIT WASHER

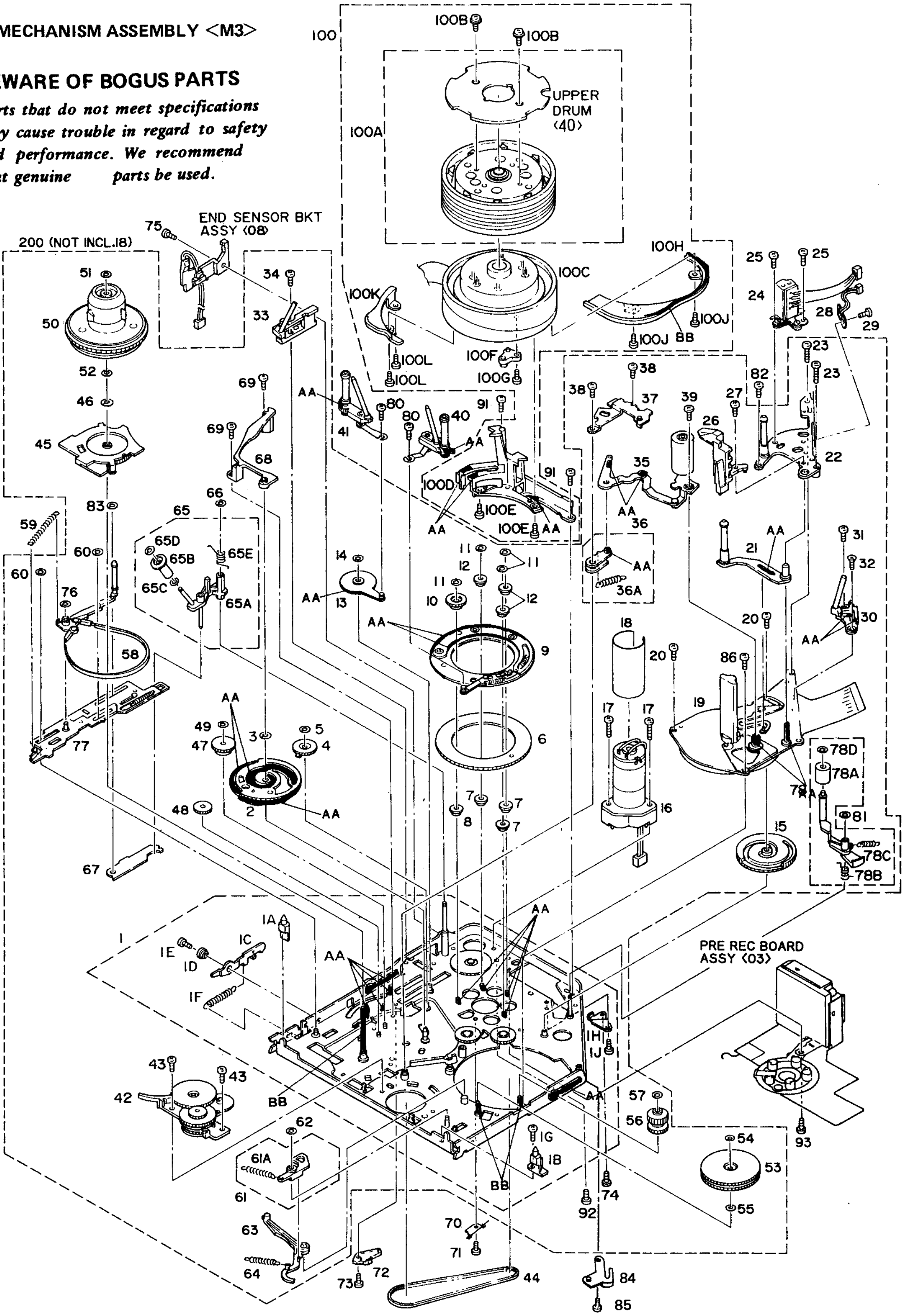
DEVIATING PARTS FOR 68VKR70/40 (M2)

Pos.	**Parts code**	**Description**
1	4822 432 60551	LOWER CASE ASSY /01
4	4822 432 60554	REAR COVER ASSY /01
7	4822 432 60552	CASSETTE COVER ASSY /01
9	4822 432 60553	FRONT PANEL ASSY /01
13	4822 432 60555	UPPER COVER ASSY /01
16A	4822 532 61199	HOOD /01
20	4822 466 62037	BATTERY BASE SHEET /01
21	4822 462 41802	HOOD CAP ASSY /01
26	4822 321 61178	CPU PWB /01
38	4822 691 20659	HOUSING ASSY /01
43	4822 466 40614	GRIP PAD /01

6.3 MECHANISM ASSEMBLY <M3>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine parts be used.


100
100B
100B
100A
UPPER DRUM ‹40›
100C
100H
100K
100J
100J
BB
100L
100L
100F
100G
END SENSOR BKT ASSY ‹08›
75
200 (NOT INCL.18)
51
50
52
46
45
34
33
69
69
68
AA
41
80
80
40
91
91
100D
100E
100E
AA
38
38
37
39
35
36
36A
26
27
82
25
25
24
28
29
23
23
22
21
31
32
30
20
20
86
19
18
17
17
16
15
78D
78A
78
81
78C
78B
83
59
60
60
76
58
77
66
65
65D
65B
65E
65C
65A
14
13
11
12
11
10
12
9
6
7
7
8
7
49
47
3
5
4
2
48
67
1
1A
1E
1C
1D
1F
1H
1J
PRE REC BOARD ASSY ‹03›
43
43
42
62
61A
61
63
64
1G
1B
57
56
54
53
55
93
92
74
70
71
72
73
44
84
85

Category	Part number	MARK
Grease	Moriton Grease No.1	AA
Oil	Cosm Hydro HV100	BB

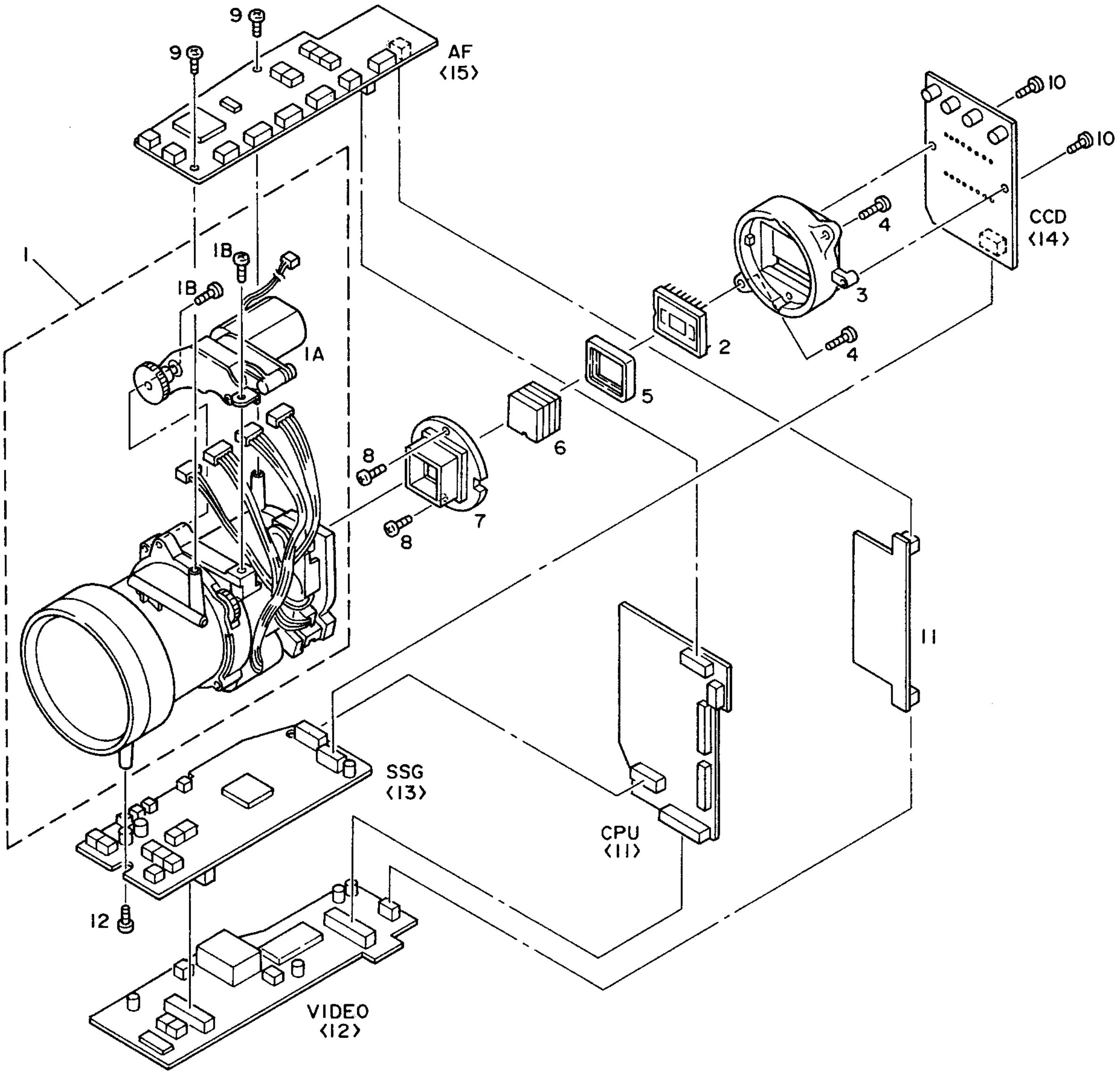
NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

MECHANISM ASSEMBLY (M3)

Pos.	Parts code	Description
1A	4822 535 93215	GUIDE PIN (S)
1B	4822 535 93216	GUIDE PIN (T)
1C	4822 403 70368	CANCEL PLATE
1D	4822 532 12071	COLLAR
1F	4822 492 33265	TENSION SPRING
1H	4822 403 70371	SUPPORT PLATE
2	4822 522 33054	CONTROL CAM GEAR
3	4822 532 11561	SLIT WASHER
4	4822 522 33063	LOADING GEAR 2
5	4822 532 51918	SLIT WASHER
6	4822 522 33056	DRIVE GEAR
7	4822 403 70375	LOADING GUIDE,X3
8	4822 403 70376	LOADING GUIDE 2
9	4822 522 33057	LOADING RING ASSY
10	4822 522 33064	SUPPLY MIDDLE GEAR
11	4822 532 51918	SLIT WASHER,X4
12	4822 532 12072	L.WASHER,X3
13	4822 522 33058	SUPPLY LOADING GEAR
14	4822 532 51918	SLIT WASHER
15	4822 522 33055	MIDDLE POLE CAM GEAR
16	4822 361 30337	LOADING MOTOR ASSY
19	4822 361 21428	CAPSTAN MOTOR ASSY
21	4822 403 70363	MIDDLE POLE ARM ASSY
22	4822 403 70362	SUB DECK ASSY
24	4822 249 10429	A/C HEAD FINAL ASSY
26	4822 403 70351	CASSETTE BLOCK
28	4822 116 90754	DEW SENSER
30	4822 403 70372	MIDDLE POLE CATCHER
33	4822 403 70364	SUPPLY SLANT POLE ASSY
35	4822 403 70333	PINCH ROLLER ARM ASSY
36	4822 403 70365	SPRING PLATE ASSY
37	4822 403 70366	GUIDE PLATE ASSY
40	4822 403 70373	TAKE UP POLE BASE
41	4822 403 70374	SUPPLY POLE BASE
42	4822 522 33065	CENTER GEAR ASSY
44	4822 358 31112	TIMING BELT
45	4822 466 82811	CAM SW ASSY
46	4822 532 11778	SLIT WASHER
47	4822 522 33059	ENCODER GEAR (1)
48	4822 522 33061	ENCODER GEAR (2)
49	4822 532 51918	SLIT WASHER
50	4822 528 10818	SUPPLY REEL DISK ASSY
51	4822 532 51918	SLIT WASHER
52	4822 532 11612	WASHER
53	4822 522 33066	TAKE UP CLUTCH ASSY

54	4822 532 51918	SLIT WASHER
55	4822 532 11612	WASHER
56	4822 522 33062	TAKE UP GEAR
57	4822 532 51918	SLIT WASHER
58	4822 403 70367	TENSION ARM ASSY
59	4822 492 33266	TENSION SPRING
60	4822 532 51918	SLIT WASHER,X2
61	4822 403 70361	SEARCH BRAKE SUB ASSY
62	4822 532 51918	SLIT WASHER
63	4822 403 70369	BRAKE DRIVE LEVER
64	4822 492 33264	TENSION SPRING
65	4822 403 70355	IMPE.ROLLER ARM
66	4822 532 51918	SLIT WASHER
67	4822 403 70356	CANCEL LEVER
68	4822 462 30525	SUPPLY GUIDE RAIL
70	4822 479 30137	BRUSH
72	4822 403 70349	LED GUIDE
76	4822 532 51918	SLIT WASHER
77	4822 403 70354	SLIDE PLATE ASSY
78	4822 403 70358	HEAD CLEANER ASSY
81	4822 532 51918	SLIT WASHER
83	4822 532 51918	SLIT WASHER
84	4822 403 70359	HOLDER
100A	4822 691 20652	UPPER DRUM ASSY
100C	4822 691 20653	LOWER DRUM MOT ASSY
100D	4822 403 70347	UV BASE
100F	4822 403 70348	DRUM SPACER
100H	4822 462 30523	TAKE UP GUIDE RAIL
100K	4822 462 30524	SUP GUIDE RAIL

6.4 OPTICAL BLOCK ASSEMBLY <M4>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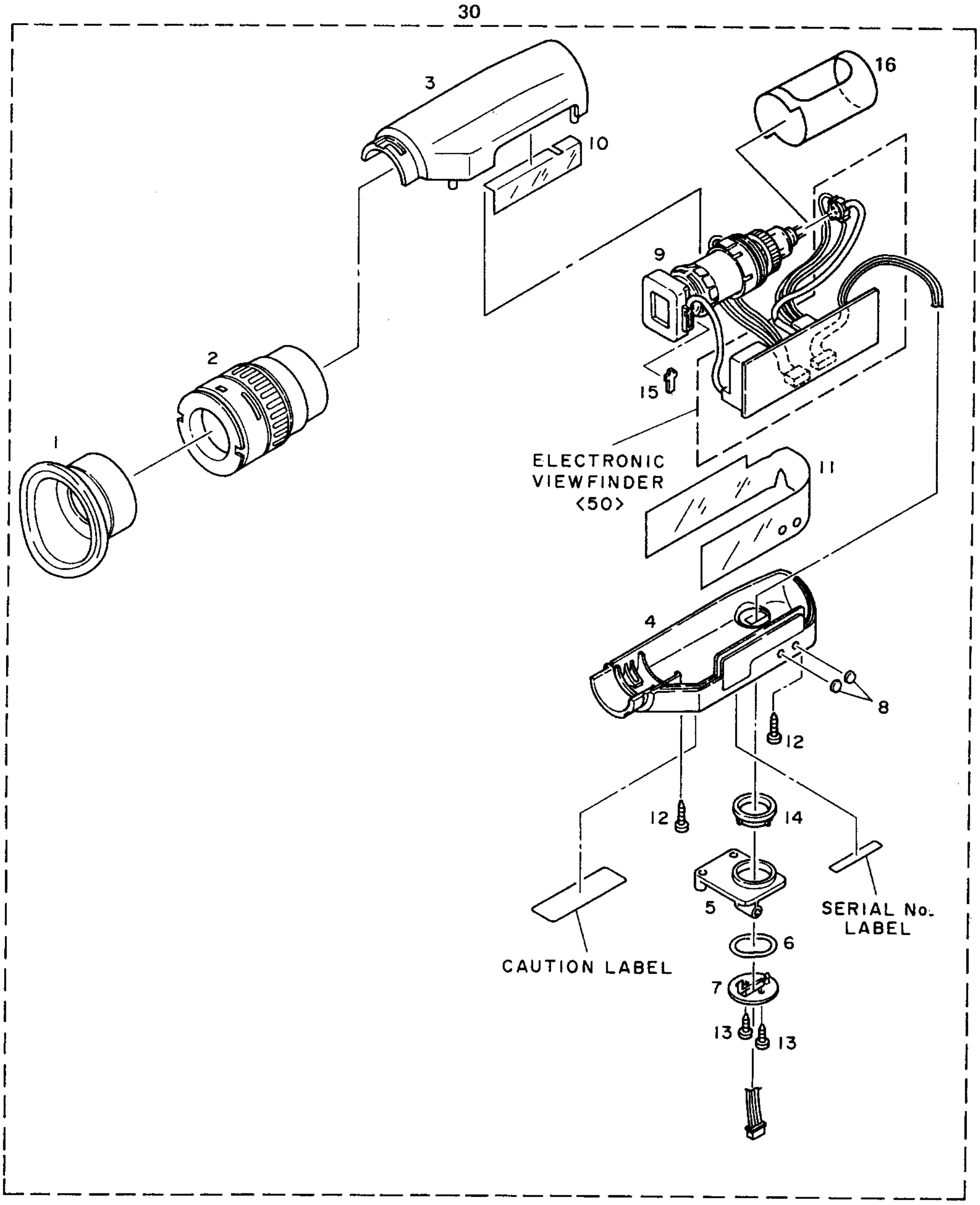
7
8
11
SSG
<13>
CPU
<11>
12
VIDEO
<12>

OPTICAL BLOCK ASSEMBLY (M4)

Pos.	Parts code	Description
1	4822 691 20642	OPTICAL BLOCK ASSY
1A	4822 361 21427	ZOOM MOTOR ASSY
2	4822 209 63622	IC (CCD)
3	4822 256 91767	IMAGER HOLDER
5	4822 466 92994	SPACER RUBBER
6	4822 381 11249	OPTICAL LPF
7	4822 256 91768	OPTICAL LPF HOLDER
11	4822 214 33276	DC-DC CONVERTER

<M5> ELECTRICAL VIEWFINDER ASSEMLY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3
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10
9
2
15
1
ELECTRONIC
VIEWFINDER
<50>
11
4
8
12
12
14
5
SERIAL No.
LABEL
6
CAUTION LABEL
7
13
13

ELECTRICAL VIEWFINDER ASSEMBLY (M5)

Pos.	Parts code	Description
1	4822 462 41798	EYE CAP
2	4822 381 11248	LENS ASSY
3	4822 432 60544	TOP CASE
4	4822 432 60545	BOTTOM CASE
5	4822 466 82809	MOUNTING PLATE
6	4822 532 52331	WAVE WASHER
7	4822 462 71752	SHOE COVER
8	4822 462 71751	CAP,X2
9	4822 131 20405	CRT/DY ASSY
14	4822 532 12067	BUSHING
30	4822 691 20643	E.VF ASSY

SECTION 7
ELECTRICAL PARTS LIST

VTR BOARD ASSEMBLY

Pos.	Parts code	Description
IC31	4822 209 60597	IC BA7757BK
IC32	4822 209 63526	IC LM324DB
IC101	4822 209 63769	IC JCY0001B1
IC102	4822 209 63615	IC JCY0002A1
IC104	4822 209 63628	IC M56780VP
IC105	4822 209 63603	IC BA7043FS
IC251	4822 209 61757	IC VC5035
IC252	4822 209 63771	IC LB1851M
IC301	4822 209 63772	IC M37414M5-110FP
IC302	4822 209 63542	IC M54543AFP
IC303	4822 209 72379	IC BU4584BF
IC304	4822 209 63633	IC S-87050CF
IC305	4822 209 63528	IC LM358DB
IC401	4822 209 63604	IC BA7046F
IC402	4822 209 60313	IC BU4053BF
IC403	4822 209 72396	IC TC4S69F
IC410	4822 209 63634	IC UPC1093T
IC501	4822 209 62535	IC BA7288K
IC502	4822 209 61991	IC TL8809F
IC601	4822 209 63627	IC M51469HP
Q1	4822 130 62662	TR DTC144E
Q16	4822 130 62608	TR 2SA1577(QR)
Q17-19	4822 130 62611	TR 2SC4617(RS)
Q20	4822 130 62598	TR DTA124EE
Q21,22	4822 130 62662	TR DTC144EE
Q34	4822 130 62608	TR 2SA1577(QR)
Q35	4822 130 62662	TR DTC144EE
Q36	4822 130 62608	TR 2SA1577(QR)
Q37	4822 130 62662	TR DTC144EE
Q38	4822 130 62611	TR 2SC4617(RS)
Q39,40	4822 130 62662	TR DTC144EE
Q41	4822 130 62598	TR DTA124EE
Q42	4822 130 62604	TR UMW1
Q101	4822 130 62565	TR UN9213
Q102	4822 130 62601	TR DTC114EE
Q103	4822 130 62565	TR UN9213
Q104	4822 130 62605	TR UMZ1
Q106	4822 130 62605	TR UMZ1
Q110	4822 130 62609	TR 2SA1774(RS)
Q111	4822 130 62611	TR 2SC4617(RS)
Q112,13	4822 130 62599	TR DTA144EE
Q114	4822 130 62611	TR 2SC4617(RS)
Q116	4822 130 62611	TR 2SC4617(RS)
Q117	4822 130 62565	TR UN9213
Q120	4822 130 62599	TR DTA144EE
Q121	4822 130 60862	TR 2SA1576(Q)
Q122	4822 130 62565	TR UN9213
Q123,24	4822 130 62603	TR UMG2
Q301	4822 130 62597	TR DTA114EE
Q302,03	4822 130 62609	TR 2SA1774(QRS)
Q304	4822 130 62611	TR 2SC4617(QRS)
Q305,06	4822 130 62601	TR DTC114EE
Q401	4822 130 62609	TR 2SA1774(QRS)
Q501,02	4822 130 62611	TR 2SC4617(QRS)
Q504	4822 130 62609	TR 2SA1774(QRS)
Q505,06	4822 130 62611	TR 2SC4617(QRS)
Q511	4822 130 62611	TR 2SC4617(QRS)
Q512,13	4822 130 62662	TR DTC144EE
Q514	4822 130 62663	TR 2SA1774(QRS)
Q515	4822 130 62611	TR 2SC4617(QRS)
Q516	4822 130 62609	TR 2SA1774(QRS)
Q517	4822 130 62662	TR DTC144EE
Q521-24	4822 130 62608	TR 2SA1577(QR)
Q526	4822 130 62599	TR DTA144EE
Q527	4822 130 62609	TR 2SA1774(RS)
Q601,02	4822 130 62662	TR DTC144EE
Q603	4822 130 62599	TR DTA144EE
Q604	4822 130 62662	TR DTC144EE
Q607,08	4822 130 62662	TR DTC144EE
Q609	4822 130 62611	TR 2SC4617(QRS)
Q612	4822 130 62662	TR DTC144EE
Q691	4822 130 62611	TR 2SC4617(QRS)
D1	4822 130 82472	DIODE DAN222
D3	4822 130 82524	DIODE DA221
D16	4822 130 82472	DIODE DAN222
D102	4822 130 81396	DIODE RB451F
D103	4822 130 82472	DIODE DAN222
D104	4822 130 80376	DIODE MA141WA
D105	4822 130 82472	DIODE DAN222
D106,07	4822 130 82525	Z.DIODE DTZ6.8
D108	4822 130 82472	DIODE DAN222
D251,52	4822 130 82472	DIODE DAN222
D301	4822 130 82472	DIODE DAN222
D302	4822 130 81396	DIODE RB451F
D303	4822 130 82472	DIODE DAN222
D304,05	4822 130 82191	Z.DIODE RD6.8M
D307	4822 130 82191	Z.DIODE RD6.8M
D502	4822 130 82472	DIODE DAN222
D504-06	4822 130 82472	DIODE DAN222
D508	4822 130 82472	DIODE DAN222
D510	4822 130 82524	DIODE DA221
D513	4822 130 82472	DIODE DAN222
D603	4822 130 82524	DIODE DA221
R2	4822 116 81482	RES 1K 1/16W
R16	4822 116 81483	RES 10K 1/16W
R17	4822 116 81521	RES 5.6K 1/16W
R18,19	4822 116 81512	RES 39K 1/16W
R20,21	4822 051 30568	RES 5.6 1/16W
R22	4822 116 81482	RES 1K 1/16W
R23	4822 116 81489	RES 15K 1/16W
R35	4822 116 81486	RES 12K 1/16W
R37	4822 116 81868	RES 1.8M 1/16W
R38	4822 116 81498	RES 22K 1/16W
R39	4822 116 81483	RES 10K 1/16W
R40	4822 116 81498	RES 22K 1/16W
R43	4822 116 81482	RES 1K 1/16W
R44	4822 116 81863	RES 120 1/16W
R45	4822 116 81497	RES 2.2K 1/16W
R46	4822 116 81504	RES 27K 1/16W
R49	4822 116 81479	RES 10 1/16W
R50	4822 116 81689	RES 47 1/16W
R51	4822 116 81498	RES 22K 1/16W
R52	4822 116 81863	RES 120 1/16W
R53	4822 116 81686	RES 120K 1/16W
R54	4822 116 81511	RES 3.9K 1/16W
R55	4822 116 81497	RES 2.2K 1/16W

R56	4822 116 81525	RES 680	1/16W
R57	4822 116 81871	RES 3K	1/16W
R58	4822 116 81503	RES 2.7K	1/16W
R59	4822 116 81865	RES 13K	1/16W
R60	4822 116 81483	VR AUDIO PB 10K	
R64,65	4822 116 81486	RES 12K	1/16W
R66-68	4822 116 81532	RES 82	1/16W
R69	4822 116 81506	RES 330	1/16W
R70	4822 116 81515	RES 4.7K	1/16W
R71,72	4822 116 82915	RES 51K	1/16W
R73	4822 116 82914	RES 24K	1/16W
R74,75	4822 116 82913	RES 100K	1/16W
R76	4822 116 81506	RES 330	1/16W
R77	4822 116 82915	RES 51K	1/16W
R78	4822 116 81515	RES 4.7K	1/16W
R82,83	4822 116 81483	RES 10K	1/16W
R84	4822 116 81498	RES 22K	1/16W
R85	4822 051 30228	RES 2.2	1/16W
R86	4822 100 11694	VR BIAS 47K	
R88	4822 116 81483	RES 10K	1/16W
R89	4822 116 81521	RES 5.6K	1/16W
R90	4822 116 81503	RES 2.7K	1/16W
R91	4822 116 81486	RES 12K	1/16W
R92	4822 116 81688	RES 220K	1/16W
R93	4822 116 81521	RES 5.6K	1/16W
R94	4822 116 81526	RES 6.8K	1/16W
R101	4822 116 81497	RES 2.2K	1/16W
R103	4822 100 11695	VR PB SW POINT 470K	
R104	4822 116 82916	RES 120K	1/10W
R107,08	4822 116 81482	RES 1K	1/16W
R112	4822 116 81482	RES 1K	1/16W
R114-17	4822 116 81507	RES 3.3K	1/16W
R120	4822 116 81483	RES 10K	1/16W
R121	4822 116 81717	RES 12K	1/16W
R122	4822 116 82908	RES 2.2K	1/16W
R123	4822 116 82907	RES 15K	1/16W
R124	4822 116 82906	RES 1.2K	1/16W
R125	4822 116 81483	RES 10K	1/16W
R126	4822 116 81498	RES 22K	1/16W
R127	4822 116 81527	RES 68K	1/16W
R128	4822 116 81483	RES 10K	1/16W
R129	4822 116 82169	RES 330K	1/16W
R130	4822 116 81484	RES 1M	1/16W
R131,32	4822 116 81516	RES 47K	1/16W
R135-37	4822 116 81482	RES 1K	1/16W
R138	4822 116 81525	RES 680	1/16W
R139	4822 116 81482	RES 1K	1/16W
R140	4822 116 81483	RES 10K	1/16W
R141	4822 116 81535	RES 82K	1/16W
R143	4822 116 82169	RES 330K	1/16W
R144	4822 116 81483	RES 10K	1/16W
R145,46	4822 116 81484	RES 1M	1/16W
R147,48	4822 116 81491	RES 150K	1/16W
R151	4822 116 81483	RES 10K	1/16W
R152-56	4822 116 81482	RES 1K	1/16W
R160	4822 116 81483	RES 10K	1/16W
R161	4822 116 81482	RES 39K	1/16W
R161	4822 116 81512	RES 1K	1/16W
R163	4822 116 81507	RES 3.3K	1/16W
R164	4822 116 81517	RES 470K	1/16W
R165	4822 116 81483	RES 10K	1/16W
R170	4822 116 81482	RES 1K	1/16W
R172,73	4822 116 81483	RES 10K	1/16W
R174	4822 116 81869	RES 270K	1/16W
R175	4822 116 81528	RES 680K	1/16W
R176	4822 116 81511	RES 3.9K	1/16W
R177	4822 116 81483	RES 10K	1/16W

R179-81	4822 116 81483	RES 10K	1/16W
R182	4822 116 81504	RES 27K	1/16W
R183	4822 116 81506	RES 330	1/16W
R185	4822 116 81534	RES 8.2K	1/16W
R186	4822 116 81483	RES 10K	1/16W
R188	4822 116 81483	RES 10K	1/16W
R190,91	4822 116 81508	RES 33K	1/16W
R196	4822 116 81483	RES 10K	1/16W
R198	4822 116 81483	RES 10K	1/16W
R199	4822 116 81516	RES 47K	1/16W
R200	4822 051 30123	RES 12K	1/16W
R213	4822 116 81483	RES 10K	1/16W
R214	4822 116 81504	RES 27K	1/16W
R215,16	4822 116 81483	RES 10K	1/16W
R231	4822 116 81482	RES 1K	1/16W
R251	4822 116 81482	RES 1K	1/16W
R252	4822 116 81491	RES 150K	1/16W
R253	4822 116 81489	RES 15K	1/16W
R254	4822 116 81508	RES 33K	1/16W
R255	4822 116 81515	RES 4.7K	1/16W
R257	4822 116 81487	RES 150	1/16W
R258	4822 116 81516	RES 47K	1/16W
R261-63	4822 051 30228	RES 2.2	1/16W
R264	4822 116 82937	RES 0.68	1/2W
R268,69	4822 116 81483	RES 10K	1/16W
R276	4822 116 81508	RES 33K	1/16W
R277	4822 116 81482	RES 1K	1/16W
R278	4822 116 81525	RES 680	1/16W
R279-81	4822 051 30228	RES 2.2	1/16W
R282	4822 116 81483	RES 10K	1/16W
R284	4822 116 82169	RES 330K	1/16W
R301	4822 116 81508	RES 33K	1/16W
R302	4822 116 81484	RES 1M	1/16W
R303	4822 116 81497	RES 2.2K	1/16W
R304	4822 116 81483	RES 10K	1/16W
R305,06	4822 116 81515	RES 4.7K	1/16W
R307	4822 116 81508	RES 33K	1/16W
R309	4822 116 81483	RES 10K	1/16W
R310	4822 116 81531	RES 750	1/16W
R311,12	4822 116 81483	RES 10K	1/16W
R313	4822 116 81481	RES 100	1/16W
R314	4822 116 81497	RES 2.2K	1/16W
R315	4822 116 82911	RES 36K	1/16W
R316	4822 116 82909	RES 30K	1/16W
R317	4822 116 81877	RES 68K	1/16W
R318	4822 116 81483	RES 10K	1/16W
R319	4822 116 81484	RES 1M	1/16W
R320-22	4822 116 81497	RES 2.2K	1/16W
R323	4822 116 81482	RES 1K	1/16W
R324	4822 116 81497	RES 2.2K	1/16W
R327	4822 116 81497	RES 2.2K	1/16W
R328	4822 116 81515	RES 4.7K	1/16W
R329-31	4822 116 81497	RES 2.2K	1/16W
R332	4822 116 81498	RES 22K	1/16W
R333,34	4822 116 81515	RES 4.7K	1/16W
R335	4822 116 81483	RES 10K	1/16W
R336	4822 116 81498	RES 22K	1/16W
R337	4822 116 81497	RES 2.2K	1/16W
R338	4822 116 81498	RES 22K	1/16W
R339-42	4822 116 81497	RES 2.2K	1/16W
R343	4822 116 81483	RES 10K	1/16W
R344	4822 116 81497	RES 2.2K	1/16W
R345	4822 116 81483	RES 10K	1/16W
R346	4822 116 81497	RES 2.2K	1/16W
R347	4822 116 81516	RES 47K	1/16W

R348	4822 101 10886	RES 100K 1/16W
R349	4822 116 81482	RES 1K 1/16W
R350	4822 116 81497	RES 2.2K 1/16W
R351	4822 116 81483	RES 10K 1/16W
R352	4822 116 81497	RES 2.2K 1/16W
R353	4822 116 81483	RES 10K 1/16W
R354	4822 116 81497	RES 2.2K 1/16W
R355	4822 116 81483	RES 10K 1/16W
R356	4822 116 81497	RES 2.2K 1/16W
R357	4822 116 81498	RES 22K 1/16W
R358,59	4822 116 81497	RES 2.2K 1/16W
R360	4822 116 81483	RES 10K 1/16W
R361	4822 116 81497	RES 2.2K 1/16W
R362	4822 116 81483	RES 10K 1/16W
R363	4822 116 81497	RES 2.2K 1/16W
R364	4822 116 81483	RES 10K 1/16W
R365	4822 116 81497	RES 2.2K 1/16W
R366	4822 116 81483	RES 10K 1/16W
R367	4822 116 81497	RES 2.2K 1/16W
R368	4822 116 81498	RES 22K 1/16W
R369	4822 116 81497	RES 2.2K 1/16W
R370	4822 116 81498	RES 22K 1/16W
R371	4822 116 81497	RES 2.2K 1/16W
R372	4822 116 81498	RES 22K 1/16W
R373	4822 116 81504	RES 27K 1/16W
R374,75	4822 116 81483	RES 10K 1/16W
R376	4822 116 81498	RES 22K 1/16W
R377	4822 116 81497	RES 2.2K 1/16W
R378	4822 116 81498	RES 22K 1/16W
R379,80	4822 116 81497	RES 2.2K 1/16W
R390	4822 116 81688	RES 220K 1/16W
R391	4822 116 81482	RES 1K 1/16W
R392	4822 116 81498	RES 22K 1/16W
R393	4822 116 81686	RES 120K 1/16W
R401	4822 116 81508	RES 33K 1/16W
R402	4822 116 81504	RES 27K 1/16W
R403	4822 116 81517	RES 470K 1/16W
R404	4822 100 11694	VR FH 47K 1/2W
R405,06	4822 116 81497	RES 2.2K 1/16W
R407	4822 116 81494	RES 18K 1/16W
R408	4822 101 10886	RES 100K 1/16W
R411	4822 116 81482	RES 1K 1/16W
R412,13	4822 116 82912	RES 10K 1/16W
R501,02	4822 116 81534	RES 8.2K 1/16W
R503	4822 116 81533	RES 820 1/16W
R504	4822 116 81482	RES 1K 1/16W
R505	4822 116 81503	RES 2.7K 1/16W
R506	4822 116 81502	RES 270 1/16W
R507	4822 116 81485	RES 1.2K 1/16W
R508	4822 116 81525	RES 680 1/16W
R509	4822 116 81506	RES 330 1/16W
R510	4822 116 81482	RES 1K 1/16W
R513	4822 116 81482	RES 1K 1/16W
R514,15	4822 116 81497	RES 2.2K 1/16W
R516	4822 116 81509	RES 390 1/16W
R517	4822 116 81533	RES 820 1/16W
R518	4822 116 81509	RES 390 1/16W
R519	4822 116 81508	RES 33K 1/16W
R520	4822 116 81489	RES 15K 1/16W
R521	4822 116 81482	RES 1K 1/16W
R522,23	4822 116 81519	RES 560 1/16W
R524	4822 116 81493	RES 1.8K 1/16W
R528	4822 116 81481	RES 100 1/16W
R532,33	4822 116 81482	RES 1K 1/16W
R536	4822 116 81515	RES 4.7K 1/16W
R537	4822 116 81514	RES 470 1/16W
R538	4822 116 81508	RES 33K 1/16W
R539	4822 116 81489	RES 15K 1/16W

R540	4822 116 81482	RES 1K 1/16W
R542	4822 116 81503	RES 2.7K 1/16W
R543	4822 116 81514	RES 470 1/16W
R544,45	4822 116 81495	RES 20K 1/16W
R546	4822 116 81483	RES 10K 1/16W
R547	4822 116 81488	RES 1.5K 1/16W
R548	4822 116 81482	RES 1K 1/16W
R550	4822 116 81486	RES 12K 1/16W
R551	4822 116 81504	RES 27K 1/16W
R552	4822 116 81508	RES 33K 1/16W
R553	4822 116 81504	RES 27K 1/16W
R554	4822 116 81483	RES 10K 1/16W
R555	4822 116 81497	RES 2.2K 1/16W
R557	4822 116 81522	RES 56K 1/16W
R558	4822 116 81488	RES 1.5K 1/16W
R559,60	4822 116 81482	RES 1K 1/16W
R561	4822 116 81497	RES 2.2K 1/16W
R562	4822 116 81503	RES 2.7K 1/16W
R563	4822 101 10886	RES 100K 1/16W
R564	4822 116 81519	RES 560 1/16W
R565	4822 116 81496	RES 220 1/16W
R566	4822 116 81874	RES 820K 1/16W
R568	4822 116 81483	RES 10K 1/16W
R572	4822 116 81506	RES 330 1/16W
R574	4822 116 81502	RES 270 1/16W
R585,86	4822 116 81483	RES 10K 1/16W
R587,88	4822 116 81482	RES 1K 1/16W
R589	4822 116 81483	RES 10K 1/16W
R591	4822 116 81488	RES 1.5K 1/16W
R592	4822 116 81507	RES 3.3K 1/16W
R593	4822 116 81488	RES 1.5K 1/16W
R594	4822 116 81507	RES 3.3K 1/16W
R595	4822 116 81485	RES 1.2K 1/16W
R596	4822 116 81508	RES 33K 1/16W
R598	4822 116 81508	RES 33K 1/16W
R599	4822 116 81488	RES 1.5K 1/16W
R601,02	4822 116 81482	RES 1K 1/16W
R603,04	4822 116 81483	RES 10K 1/16W
R605	4822 116 81516	RES 47K 1/16W
R606	4822 116 81511	RES 3.9K 1/16W
R607	4822 116 81498	RES 22K 1/16W
R608,09	4822 116 81483	RES 10K 1/16W
R610,11	4822 116 81508	RES 33K 1/16W
R612	4822 116 81498	RES 22K 1/16W
R613	4822 116 81533	RES 820 1/16W
R615	4822 116 81511	RES 3.9K 1/16W
R616	4822 116 81489	RES 15K 1/16W
R618	4822 116 81511	RES 3.9K 1/16W
R619	4822 116 81493	RES 1.8K 1/16W
R620	4822 116 81522	RES 56K 1/16W
R621	4822 116 81483	RES 10K 1/16W
R623,24	4822 116 81483	RES 10K 1/16W
R625	4822 116 81485	RES 1.2K 1/16W
R626	4822 116 81514	RES 470 1/16W
R628	4822 101 10886	RES 100K 1/16W
R629	4822 116 81486	RES 12K 1/16W
R630-32	4822 116 81482	RES 1K 1/16W
R634	4822 116 81521	RES 5.6K 1/16W
R635	4822 116 81482	RES 1K 1/16W
R639	4822 116 81483	RES 10K 1/16W
R640	4822 116 81507	RES 3.3K 1/16W
R651	4822 100 11692	VR REC FM 2.2K
R652	4822 100 11692	VR PB RF EQ 2.2K
R653	4822 100 11694	VR PB Y 47K
R654	4822 100 11697	VR DARK CLIP 68K
R655	4822 100 11689	VR WHITE CLIP 100K
R656	4822 100 11693	VR CARRIER 22K

R657	4822 100 11688	VR DEVIATION 10K
R658	4822 100 11688	VR EE Y 10K
R659	4822 100 11688	VR EE BURST 10K
R660	4822 100 11691	VR 1H DL 1.5K
R665	4822 100 11687	VR PB COLOUR 1K
R666	4822 100 11693	VR FH VCO 22K
R667	4822 100 11692	VR PB BURST 2.2K
R668	4822 100 11696	VR REC COLOUR 680
R691	4822 116 81507	RES 8.2K 1/16W
R692	4822 116 81535	RES 82K 1/16W
R693	4822 116 81502	RES 220 1/16W
C2-5	4822 124 11167	TAN CAP 4.7U 20V
C7	4822 124 11164	TAN CAP 3.3U 10V
C8,9	4822 124 11167	TAN CAP 4.7U 20V
C10	4822 124 11164	TAN CAP 3.3U 10V
C16	4822 126 11395	CAP 5P 16V
C17	4822 122 33992	CAP 0.1U 25V
C18	4822 126 10494	CAP 270P 16V
C19,20	4822 126 10873	CAP 180P 16V
C21	4822 126 11396	CAP 680P 16V
C32	4822 124 23634	E CAP 33U
C33	4822 124 23635	E CAP 22U
C34	4822 124 23631	E CAP 1U 50V
C35	4822 124 23629	E CAP 10U 16V
C38	4822 124 23631	E CAP 1U 50V
C39	4822 124 23632	E CAP 22U 6.3V
C40	4822 122 90058	CAP 0.0047U 50V
C41	4822 124 23633	E CAP 10U 16V
C43	4822 126 10016	CAP 0.0012U 50V
C45	4822 126 10027	CAP 220P 50V
C46	4822 124 23631	E CAP 1U 50V
C48	4822 122 90061	CAP 680P 50V
C49	4822 124 23628	E CAP 22U 4V
C50	4822 122 90063	CAP 0.022U 16V
C51	4822 124 23634	E CAP 33U
C52	4822 124 11168	TAN CAP 0.47U 25V
C53	4822 122 90062	CAP 0.0068U 50V
C54	4822 126 10018	CAP 0.0033U 50V
C55	4822 124 11169	TAN CAP 0.1U 35V
C57	4822 126 10015	CAP 0.001U 50V
C58	4822 122 90057	CAP 470P 50V
C61-68	4822 122 90068	CAP 100P
C71	4822 124 23634	E CAP 33U
C72	4822 122 90056	CAP 0.0039U 50V
C73	4822 126 11394	CAP 560P 50V
C74	4822 121 20247	CAP 0.33U
C75	4822 122 90057	CAP 470P 50V
C76	4822 124 11165	TAN CAP 1U 16V
C77	4822 124 11163	TAN CAP 10U 4V
C78	4822 124 11166	TAN CAP 1U 16V
C79,80	4822 124 11171	TAN CAP 15U 6.3V
C101,02	4822 124 23633	E CAP 10U 16V
C103	4822 126 10055	CAP 0.1U 16V
C105	4822 126 10015	CAP 0.001U 50V
C106	4822 122 90056	CAP 0.0039U 50V
C110	4822 122 33984	CAP 0.01U 25V
C111	4822 126 10874	CAP 0.1U 25V
C112	4822 122 90052	CAP 0.0022U 50V
C113	4822 126 11393	CAP 0.022U 25V
C114,15	4822 126 10015	CAP 0.001U 50V
C116	4822 124 23653	E CAP 22U 16V
C117	4822 122 10532	CAP 1U 16V
C120	4822 126 11393	CAP 0.022U 25V
C121	4822 126 11431	CAP 0.22U 16V
C122	4822 122 90052	CAP 0.0022U 50V

C123	4822 126 11393	CAP 0.022U 25V
C124,25	4822 126 10015	CAP 0.001U 50V
C126	4822 124 23652	E CAP 10U 16V
C127,28	4822 122 10532	CAP 1U 16V
C130	4822 126 10055	CAP 0.1U 16V
C131	4822 122 33985	CAP 10P 50V
C132	4822 122 33984	CAP 0.01U 25V
C134	4822 126 10015	CAP 0.001U 50V
C135	4822 126 10055	CAP 0.1U 16V
C136	4822 126 11423	CAP 100P
C138	4822 122 90059	CAP 0.0056U 50V
C139,40	4822 122 10532	CAP 1U 16V
C141	4822 126 10055	CAP 0.1U 16V
C147	4822 126 10055	CAP 0.1U 16V
C148	4822 122 33984	CAP 0.01U 25V
C150	4822 122 33984	CAP 0.01U 25V
C151	4822 126 10019	CAP 0.047U 16V
C152,53	4822 122 33984	CAP 0.01U 25V
C155	4822 124 23633	E CAP 10U 16V
C156	4822 126 10015	CAP 0.001U 50V
C160	4822 124 23633	E CAP 10U 16V
C161	4822 126 11423	CAP 100P
C162	4822 122 90058	CAP 0.0047U 50V
C175-77	4822 126 11393	CAP 0.022U 25V
C178	4822 126 10018	CAP 0.0033U 50V
C251	4822 124 23633	E CAP 10U 16V
C252	4822 124 23648	E CAP 0.47U 50V
C253	4822 122 90054	CAP 330P 50V
C255	4822 126 10055	CAP 0.1U 16V
C257	4822 122 33984	CAP 0.01U 25V
C258	4822 126 10496	CAP 0.1U 25V
C259-61	4822 122 10532	CAP 1U 16V
C265	4822 126 10019	CAP 0.047U 16V
C266	4822 124 23647	E CAP 1U 50V
C267	4822 122 33984	CAP 0.01U 25V
C268	4822 122 90061	CAP 680P 50V
C269	4822 126 10018	CAP 0.0033U 50V
C274	4822 126 10015	CAP 0.001U 50V
C276-78	4822 126 11393	CAP 0.022U 25V
C279-81	4822 122 10532	CAP 1U 16V
C282	4822 126 10055	CAP 0.1U 16V
C283	4822 122 10532	CAP 1U 16V
C285	4822 126 10055	CAP 0.1U 16V
C286	4822 122 33985	CAP 10P 50V
C301,02	4822 124 23634	E CAP 33U
C303	4822 126 10055	CAP 0.1U 16V
C304	4822 122 33984	CAP 0.01U 25V
C305	4822 126 10055	CAP 0.1U 16V
C306-08	4822 122 33984	CAP 0.01U 25V
C309,10	4822 126 10026	CAP 22P 50V
C311	4822 122 33984	CAP 0.01U 25V
C312,13	4822 126 10055	CAP 0.1U 16V
C314	4822 126 10481	CAP 0.0047U 25V
C315,16	4822 126 10055	CAP 0.1U 16V
C317	4822 122 33984	CAP 0.01U 25V
C401	4822 126 10055	CAP 0.1U 16V
C402	4822 126 11393	CAP 0.022U 25V
C403,04	4822 126 11428	CAP 1U 16V
C405	4822 126 11427	CAP 0.1U 16V
C406	4822 126 11423	CAP 100P
C501	4822 122 33984	CAP 0.01U 25V
C502	4822 126 10022	CAP 120P 50V
C503	4822 122 33989	CAP 47P 50V
C504	4822 122 33984	CAP 0.01U 25V
C505	4822 126 10029	CAP 33P 50V

C506	4822 126 10027	CAP	220P 50V
C507	4822 126 10022	CAP	120P 50V
C508	4822 122 33984	CAP	0.01U 25V
C509	4822 124 23667	E CAP	47U
C512	4822 126 10022	CAP	120P 50V
C513	4822 122 33984	CAP	0.01U 25V
C514	4822 126 10028	CAP	27P 50V
C515	4822 126 11421	CAP	3P 50V
C516	4822 122 33984	CAP	0.01U 25V
C517	4822 126 10033	CAP	56P 50V
C518	4822 122 33988	CAP	39P 50V
C519	4822 122 90064	CAP	180P 50V
C522	4822 122 33989	CAP	47P 50V
C523	4822 124 23667	E CAP	47U
C524,25	4822 122 33984	CAP	0.01U 25V
C536,37	4822 122 33984	CAP	0.01U 25V
C538	4822 122 33989	CAP	47P 50V
C539	4822 122 33986	CAP	100P 50V
C540	4822 124 23629	E CAP	10U 16V
C543	4822 126 10741	CAP	390P 16V
C544,45	4822 124 23629	E CAP	10U 16V
C546-48	4822 122 33984	CAP	0.01U 25V
C549	4822 126 10034	CAP	68P 50V
C551	4822 124 23631	E CAP	1U 50V
C552	4822 124 23667	E CAP	47U
C553,54	4822 122 33984	CAP	0.01U 25V
C555	4822 124 11182	TAN CAP	3.3U 10V
C556	4822 124 11184	TAN CAP	0.22U 35V
C557	4822 124 11185	TAN CAP	3.3U 10V
C558	4822 124 11178	TAN CAP	4.7U 6.3V
C559	4822 122 33984	CAP	0.01U 25V
C560	4822 126 10018	CAP	0.0033U 25V
C561	4822 126 11393	CAP	0.022U 25V
C562	4822 126 10029	CAP	33P 50V
C564	4822 124 22923	E CAP	47U 6.3V
C565	4822 124 23666	CAP	0.1U
C572	4822 122 33984	CAP	0.01U 25V
C573,74	4822 124 23644	E CAP	0.47U 50V
C575	4822 124 23631	E CAP	1U 50V
C577	4822 122 33984	CAP	0.01U 25V
C578	4822 124 23667	E CAP	47U
C589	4822 122 33985	CAP	10P 50V
C601-05	4822 122 33984	CAP	0.01U 25V
C607	4822 122 90076	CAP	0.033U 50V
C609	4822 126 11429	CAP	0.068U 25V
C610	4822 126 10075	CAP	0.015U 50V
C611	4822 122 90076	CAP	0.033U 50V
C617	4822 124 11181	TAN CAP	10U 10V
C618	4822 126 11393	CAP	0.022U 25V
C619,20	4822 122 33984	CAP	0.01U 25V
C621	4822 126 11393	CAP	0.022U 25V
C622	4822 124 23645	E CAP	2.2U 35V
C623	4822 124 23631	E CAP	1U 50V
C624	4822 126 11393	CAP	0.022U 25V
C625	4822 124 23645	E CAP	2.2U 35V
C626	4822 126 11393	CAP	0.022U 25V
C627	4822 124 23667	E CAP	47U
C628	4822 122 33984	CAP	0.01U 25V
C629	4822 125 60169	V CAP	VXO 20P
C630	4822 126 11422	CAP	5P 50V
C631	4822 126 10015	CAP	0.001U 50V
C632	4822 122 33986	CAP	100P 50V
C633	4822 122 33984	CAP	0.01U 25V
C634	4822 122 90061	CAP	680P 50V
C635-37	4822 122 33984	CAP	0.01U 25V
C638	4822 124 11184	TAN CAP	0.22U 35V
C639-41	4822 122 33984	CAP	0.01U 25V

C642	4822 124 23667	E CAP	47U
C643	4822 122 33984	CAP	0.01U 25V
C645	4822 126 10026	CAP	22P 50V
C691	4822 122 33984	CAP	0.01U 25V
C692	4822 122 33984	CAP	39P 50V
C693	4822 122 33988	CAP	0.01U 25V
C694	4822 126 10026	CAP	22P 50V
C695	4822 126 10025	CAP	18P 50V
L1	4822 157 63121	COIL	47UH
L16	4822 157 63121	COIL	47UH
L17	4822 157 63123	OSC COIL	
L18	4822 157 60562	COIL	1.2UH
L32	4822 153 90049	EQUALIZER	
L33	4822 157 63119	COIL	220UH
L34	4822 157 63124	OSC COIL	
L101	4822 157 63111	COIL	27UH
L501	4822 157 63106	COIL	120UH
L502	4822 157 63107	COIL	15UH
L503	4822 157 63109	COIL	22UH
L504	4822 157 63112	COIL	270UH
L505	4822 157 63117	COIL	68UH
L506	4822 157 63121	COIL	47UH
L508	4822 157 63117	COIL	68UH
L509	4822 157 63116	COIL	56UH
L510	4822 157 63118	COIL	82UH
L511	4822 157 63109	COIL	22UH
L512	4822 157 63113	COIL	330UH
L513	4822 157 63121	COIL	47UH
L515	4822 157 63108	COIL	18UH
L521	4822 157 63104	COIL	10UH
L522	4822 157 63116	COIL	56UH
L524	4822 157 63121	COIL	47UH
L531	4822 157 63121	COIL	47UH
L533	4822 157 63099	COIL	120UH
L601	4822 157 63114	COIL	47UH
L602	4822 157 63121	COIL	47UH
L603	4822 157 62543	COIL	6.8mH
L604	4822 157 90131	COIL	1mH
L605	4822 157 63113	COIL	330UH
L607	4822 157 63113	COIL	330UH
L608	4822 157 63121	COIL	47UH
L609	4822 157 63107	COIL	15UH
L610	4822 157 63105	COIL	100UH
L691	4822 157 63115	COIL	5.6UH
L692	4822 157 63121	COIL	47UH
L693	4822 157 63117	COIL	68UH
EQ501	4822 218 30588	EQUALIZER	
LPF501	4822 157 52818	LOW PASS FILTER	
LPF502	4822 156 21628	LOW PASS FILTER	
LPF601	4822 156 21629	LOW PASS FILTER	
LPF602	4822 156 21637	LOW PASS FILTER	
TRAP1	4822 157 63122	TRAP,FT101	
TRAP2	4822 157 63141	TRAP,FT102	
BPF601	4822 156 21631	BAND PASS FILTER	
BPF602	4822 156 21632	BAND PASS FILTER	
DL601	4822 320 40246	2H DELAY LINE	
X301	4822 242 73944	X-TAL RESONATOR	
X601	4822 242 73634	X-TAL RESONATOR	
SW1	4822 276 13071	PUSH SWITCH	
DD1	4822 214 33305	DC-DC CONVERTER	
TH1	4822 116 90255	POSITIVE THERM.	
PS301	4822 130 82477	LED	
CP1	4822 209 63612	CIRCUIT PROTECTOR	
CP2	4822 209 63611	CIRCUIT PROTECTOR	
CP3	4822 209 82555	CIRCUIT PROTECTOR	

CP4	4822 209 63611	CIRCUIT PROTECTOR
CP5	4822 209 82555	CIRCUIT PROTECTOR

JACK BOARD ASSEMBLY

IC1	4822 209 72392	IC M5282FP
D1	4822 130 81399	DIODE RLZ8.2B
R1	4822 116 81677	RES 5.6K 1/10W
R2	4822 116 81675	RES 47K 1/10W
R3	4822 116 81645	RES 1K 1/10W
R4	4822 116 81546	RES 220 1/10W
R5	4822 116 81661	RES 22K 1/10W
R6	4822 116 81645	RES 1K 1/10W
R8	4822 116 81659	RES 2.2K 1/10W
R9	4822 116 81681	RES 6.8K 1/10W
R10	4822 116 81646	RES 10K 1/10W
R11	4822 111 30929	RES 10 1/8W
R12	4822 116 81647	RES 100K 1/10W
R13,14	4822 116 81546	RES 220 1/10W
R15	4822 111 30933	RES 75 1/8W
R16,17	4822 111 30931	RES 1K 1/8W
C1,2	4822 124 23667	E CAP 47U
C3	4822 124 23643	E CAP 4.7U 25V
C4	4822 126 10872	CAP 100P 16V
C5	4822 124 23646	E CAP 3.3U 35V
C6	4822 126 10064	CAP 680P 50V
C7	4822 124 23667	E CAP 47U
C8	4822 124 23643	E CAP 4.7U 25V
C9	4822 124 22917	E CAP 470U 5.5V
C10,11	4822 126 10076	CAP 0.0022U 50V
C12	4822 124 23633	E CAP 10U 16V
C18	4822 124 11183	TAN CAP 2.2U 16V
J1	4822 267 31327	JACK BOX,JACK1

TRIGGER BOARD ASSEMBLY

SW1	4822 276 13072	TACT SWITCH

CPU BOARD ASSEMBLY

IC1	4822 209 63779	IC M37120M6-106FP
IC2	4822 209 63606	IC CAT93C46K
IC3	4822 209 63631	IC S-8054HN-CB
IC4	4822 209 63629	IC S-8052ANB-NE
IC5	4822 209 63514	IC AN1393S
IC6	4822 209 60335	IC TC7S04F
IC7	4822 209 63781	IC S-81250HG-RD
IC8	4822 209 61746	IC TC4S584F
IC9,10	4822 209 61751	IC TC7S32F
Q1	4822 130 61553	TR DTC124EU
D1	4822 130 81396	DIODE RB451F
D2-4	4822 130 33953	DIODE MA704
D5	4822 130 62319	DIODE RD7.5M(B2)
D7,8	4822 130 62319	DIODE RD7.5M(B2)
R2	4822 116 81483	RES 10K 1/16W
R4,5	4822 116 81479	RES 10 1/16W
R7	4822 116 81497	RES 2.2K 1/16W
R8-11	4822 116 81483	RES 10K 1/16W
R12-16	4822 116 81497	RES 2.2K 1/16W
R17	4822 116 81514	RES 470 1/16W
R18	4822 116 81498	RES 22K 1/16W
R19-22	4822 116 81497	RES 2.2K 1/16W
R23-26	4822 116 81514	RES 470 1/16W
R27-29	4822 116 81497	RES 2.2K 1/16W
R30	4822 116 81482	RES 1K 1/16W
R31	4822 101 10886	RES 100K 1/16W
R32,33	4822 116 81497	RES 2.2K 1/16W
R34	4822 116 82172	RES 4.7M 1/16W
R35	4822 116 81484	RES 1M 1/16W
R36,37	4822 116 81864	RES 1.2M 1/16W
R38	4822 101 10886	RES 100K 1/16W
R39	4822 116 81864	RES 1.5M 1/16W
R40	4822 116 81482	RES 1K 1/16W
R41-43	4822 116 81497	RES 2.2K 1/16W
R44,45	4822 116 81479	RES 10 1/16W
R46	4822 116 81497	RES 2.2K 1/16W
R47	4822 116 81481	RES 100 1/16W
R48	4822 116 81488	RES 1.5K 1/16W
R49,50	4822 116 81497	RES 2.2K 1/16W
R51	4822 116 81483	RES 10K 1/16W
R53-59	4822 116 81497	RES 2.2K 1/16W
R60	4822 116 81498	RES 22K 1/16W
R61	4822 116 81497	RES 2.2K 1/16W
R62	4822 116 81498	RES 22K 1/16W
R65-67	4822 116 81483	RES 10K 1/16W
R70-72	4822 116 81483	RES 10K 1/16W
R73	4822 116 81479	RES 10 1/16W
R74	4822 116 81497	RES 2.2K 1/16W
R76	4822 116 81738	RES 470 1/16W
C1	4822 124 23636	E CAP 22U 6.3V
C2	4822 126 10055	CAP 0.1U 16V
C3	4822 124 23021	E CAP 330U 6.3V
C4	4822 126 10055	CAP 0.1U 16V
C5	4822 126 11428	CAP 1U 16V
C6,7	4822 126 10055	CAP 0.1U 16V
C8	4822 126 11399	CAP 30P
C10	4822 125 50407	V CAP IND POS. 20P
C11	4822 122 90096	CAP 15P
C12	4822 126 10099	CAP 12P
C15	4822 126 10055	CAP 0.1U 16V
C16,17	4822 124 23636	E CAP 22U 6.3V
C18	4822 126 10055	CAP 0.1U 16V
C19	4822 122 33984	CAP 0.01U 25V
L1	4822 157 63102	COIL 22UH
L3	4822 157 63103	COIL 39UH
X1	4822 242 71894	X-TAL RESONATOR
X2	4822 242 73943	X-TAL RESONATOR

VIDEO BOARD ASSEMBLY

IC1	4822 209 63607	IC HA118154MA
IC2	4822 209 60596	IC BA7606F
IC3,04	4822 209 60335	IC TC7S04F
IC5	4822 209 63775	IC MC8181K
IC11	4822 209 63605	IC BU2707K
IC12	4822 209 63623	IC MN4464S-08LL
IC31	4822 209 63617	IC JCY0011
IC32	4822 209 63529	IC LM393DB
Q1	4822 130 60668	TR 2SC3936(BC)
Q2	4822 130 62669	TR 2SD1819(QR)
Q3,4	4822 130 60667	TR 2SA1532(BC)
Q5	4822 130 60668	TR 2SC3936(BC)
Q6	4822 130 60667	TR 2SA1532(BC)
Q7	4822 130 60668	TR 2SC3936(BC)
Q8	4822 130 61084	TR 2SD1819(QR)
Q9,10	4822 130 60668	TR 2SC3936(BC)
Q12-21	4822 130 60668	TR 2SC3936(BC)
Q22,23	4822 130 61084	TR 2SD1819(QR)
Q25,26	4822 130 60668	TR 2SC3936(BC)
Q27	4822 130 60667	TR 2SA1532(BC)
Q30	4822 130 60667	TR 2SA1532(BC)
Q31-35	4822 130 60668	TR 2SC3936(BC)
Q36,37	4822 130 60667	TR 2SA1532(BC)

D2	4822 130 80376	DIODE MA141WA
D4	4822 130 80289	DIODE MA141WK
D10	4822 130 82475	DIODE MA366
D14	4822 130 81396	DIODE RB451F
R1	4822 116 81511	RES 3.9K 1/16W
R3	4822 116 81483	RES 10K 1/16W
R5	4822 116 81483	RES 10K 1/16W
R6	4822 100 11688	VR R. ENC BAL 10K
R7	4822 100 11688	VR B. ENC BAL 10K
R8	4822 116 81534	RES 8.2K 1/16W
R9	4822 116 81508	RES 33K 1/16W
R10	4822 116 82923	RES 20K 1/16W
R11	4822 116 82912	RES 10K 1/16W
R12	4822 116 81521	RES 5.6K 1/16W
R14	4822 116 81521	RES 5.6K 1/16W
R15	4822 116 81503	RES 2.7K 1/16W
R16	4822 116 82171	RES 3.6K 1/16W
R17	4822 116 81493	RES 1.8K 1/16W
R18	4822 116 81497	RES 2.2K 1/16W
R19	4822 116 81493	RES 1.8K 1/16W
R20	4822 116 81534	RES 8.2K 1/16W
R21	4822 116 81482	RES 1K 1/16W
R22	4822 116 81511	RES 3.9K 1/16W
R23	4822 116 81507	RES 3.3K 1/16W
R24	4822 116 81483	RES 10K 1/16W
R25	4822 116 81535	RES 82K 1/16W
R26	4822 116 81534	RES 8.2K 1/16W
R27	4822 100 11699	VR B-Y LEVEL 4.7K
R28	4822 116 81534	RES 8.2K 1/16W
R29	4822 116 81508	RES 33K 1/16W
R30,31	4822 116 81483	RES 10K 1/16W
R32	4822 116 81515	RES 4.7K 1/16W
R35	4822 116 81486	RES 12K 1/16W
R36	4822 100 11699	VR R-Y LEVEL 4.7K
R37	4822 116 81534	RES 8.2K 1/16W
R39,40	4822 116 81483	RES 10K 1/16W
R42	4822 116 81483	RES 10K 1/16W
R44	4822 116 81483	RES 10K 1/16W
R45	4822 116 81503	RES 2.7K 1/16W
R46	4822 116 81486	RES 12K 1/16W
R47	4822 116 81483	RES 10K 1/16W
R49	4822 116 81486	RES 12K 1/16W
R50	4822 116 81483	RES 10K 1/16W
R52	4822 116 81534	RES 8.2K 1/16W
R54	4822 116 81486	RES 12K 1/16W
R55	4822 116 81483	RES 10K 1/16W
R57	4822 116 81483	RES 10K 1/16W
R60,61	4822 116 81497	RES 2.2K 1/16W
R62	4822 116 82171	RES 3.6K 1/16W
R63	4822 116 81501	RES 2.4K 1/16W
R65	4822 116 81493	RES 1.8K 1/16W
R66,67	4822 116 81483	RES 10K 1/16W
R68	4822 116 81515	RES 4.7K 1/16W
R69	4822 116 81516	RES 47K 1/16W
R70	4822 116 81482	RES 1K 1/16W
R71	4822 116 81511	RES 3.9K 1/16W
R72	4822 116 82927	RES 9.1K 1/16W
R73	4822 116 82923	RES 20K 1/16W
R74	4822 116 81503	RES 2.7K 1/16W
R78	4822 116 81521	RES 5.6K 1/16W
R79	4822 116 81495	RES 20K 1/16W
R80	4822 116 81515	RES 4.7K 1/16W
R81	4822 116 81504	RES 27K 1/16W
R82	4822 116 82924	RES 2.7K 1/16W
R83	4822 116 82925	RES 27K 1/16W
R84	4822 116 82926	RES 4.7K 1/16W
R85	4822 100 11688	VR BURST PHASE 10K
R86,87	4822 116 81511	RES 3.9K 1/16W
R88	4822 116 82921	RES 1.1K 1/16W

R89	4822 100 11699	VR BURST LEVEL 4.7K
R90,91	4822 116 81482	RES 1K 1/16W
R94	4822 116 81495	RES 20K 1/16W
R95	4822 116 81497	RES 2.2K 1/16W
R96	4822 116 82922	RES 1.3K 1/16W
R97	4822 116 81521	RES 5.6K 1/16W
R98,99	4822 116 81515	RES 4.7K 1/16W
R100	4822 116 81482	RES 1K 1/16W
R101	4822 116 81483	RES 10K 1/16W
R102	4822 100 11688	VR COLOUR LEVEL 10K
R103	4822 116 81497	RES 2.2K 1/16W
R104	4822 116 81511	RES 3.9K 1/16W
R105	4822 116 81498	RES 22K 1/16W
R106	4822 116 82919	RES 7.5K 1/16W
R111	4822 116 81493	RES 1.8K 1/16W
R112	4822 116 81482	RES 1K 1/16W
R115	4822 116 81511	RES 3.9K 1/16W
R116	4822 116 81497	RES 2.2K 1/16W
R117	4822 116 81503	RES 2.7K 1/16W
R118	4822 116 81515	RES 4.7K 1/16W
R123	4822 116 81522	RES 56K 1/16W
R127	4822 116 81516	RES 47K 1/16W
R129	4822 116 81515	RES 4.7K 1/16W
R130	4822 116 81521	RES 5.6K 1/16W
R131	4822 116 81515	RES 4.7K 1/16W
R132	4822 116 81521	RES 5.6K 1/16W
R134,35	4822 116 81515	RES 4.7K 1/16W
R140	4822 116 81493	RES 1.8K 1/16W
R142	4822 116 81488	RES 1.5K 1/16W
R151	4822 116 81489	RES 15K 1/16W
R152	4822 116 81512	RES 39K 1/16W
R153	4822 100 11694	VR R GAIN 47K
R154	4822 116 81489	RES 15K 1/16W
R155	4822 116 81512	RES 39K 1/16W
R156	4822 100 11694	VR B GAIN 47K
R160-62	4822 116 81483	RES 10K 1/16W
R171	4822 116 81521	RES 5.6K 1/16W
R172	4822 116 81507	RES 3.3K 1/16W
R173	4822 116 81482	RES 1K 1/16W
R174	4822 116 81495	RES 20K 1/16W
R175	4822 116 81521	RES 5.6K 1/16W
R176	4822 116 81507	RES 3.3K 1/16W
R177	4822 116 81493	RES 1.8K 1/16W
R178	4822 116 81495	RES 20K 1/16W
R179	4822 116 81515	RES 4.7K 1/16W
R180	4822 116 81483	RES 10K 1/16W
R181	4822 116 81521	RES 5.6K 1/16W
R182	4822 051 30363	RES 36K 1/16W
R183	4822 051 30753	RES 75K 1/16W
R184	4822 116 81688	RES 220K 1/16W
R185	4822 051 30363	RES 36K 1/16W
R187	4822 116 81497	RES 2.2K 1/16W
R190	4822 116 81497	RES 2.2K 1/16W
R192-95	4822 116 81483	RES 10K 1/16W
R210	4822 116 81482	RES 1K 1/16W
R211	4822 116 81518	RES 510 1/16W
C1	4822 126 10107	CAP 100P
C2,3	4822 126 11428	CAP 1U 16V
C5,6	4822 126 10055	CAP 0.1U 16V
C7-13	4822 126 10019	CAP 0.047U 16V
C16,17	4822 126 10019	CAP 0.047U 16V
C22	4822 126 10107	CAP 100P
C23,24	4822 126 10055	CAP 0.1U 16V
C25,26	4822 126 10019	CAP 0.047U 16V
C28	4822 122 33984	CAP 0.01U 25V
C29	4822 126 10055	CAP 0.1U 16V

C30-32	4822 122 33984	CAP 0.01U 25V
C33	4822 126 10055	CAP 0.1U 16V
C34	4822 126 11428	CAP 0.047U 16V
C35	4822 126 10107	CAP 100P
C37,38	4822 122 33984	CAP 0.01U 25V
C39	4822 126 10055	CAP 0.1U 16V
C40	4822 124 23651	E CAP 100U 6.3V
C41-46	4822 126 10019	CAP 0.047U 16V
C55	4822 126 10055	CAP 0.1U 16V
C56-58	4822 126 10109	CAP 56P
C59	4822 124 23636	E CAP 22U 6.3V
C60	4822 126 10055	CAP 0.1U 16V
C61	4822 122 33984	CAP 0.01U 25V
C62	4822 126 11425	CAP 5P
C71	4822 126 10055	CAP 0.1U 16V
C73	4822 124 11176	TAN CAP 3.3U 4V
C74	4822 122 33984	CAP 0.01U 25V
C75	4822 125 60169	V CAP TITLE POS. 20P
C76	4822 122 90083	CAP 33P
C78	4822 126 10055	CAP 0.1U 16V
C79	4822 124 23636	E CAP 22U 6.3V
C83	4822 122 33984	CAP 0.01U 25V
C89	4822 124 23636	E CAP 22U 6.3V
C91	4822 124 23636	E CAP 22U 6.3V
C92	4822 126 10055	CAP 0.1U 16V
C93	4822 124 11179	TAN CAP 1U 10V
C99	4822 126 10055	CAP 0.1U 16V
C100	4822 126 11424	CAP 39P
C101	4822 126 10055	CAP 0.1U 16V
L1	4822 157 63094	COIL
L3	4822 157 63102	COIL 22UH
L4	4822 157 63125	INDUCTOR
L5	4822 157 63101	COIL 15UH
L6	4822 157 63102	COIL 22UH
BPF1	4822 157 63098	BAND PASS FILTER
DL1	4822 320 40245	DELAY LINE
DL2	4822 320 40248	DELAY LINE

SSG BOARD ASSEMBLY

IC1	4822 209 63777	IC MN5164S
IC2	4822 209 63613	IC IR3P67A
IC3	4822 209 63778	IC MSM6819MS
IC4	4822 209 61979	IC MN3820S
Q1	4822 130 60668	TR 2SC3936(BC)
Q2	4822 130 60667	TR 2SA1532(BC)
Q3	4822 130 60668	TR 2SC3936(BC)
Q4	4822 130 60667	TR 2SA1532(BC)
Q5	4822 130 60668	TR 2SC3936(BC)
Q6	4822 130 60667	TR 2SA1532(BC)
Q8	4822 130 60667	TR 2SA1532(BC)
Q9	4822 130 60668	TR 2SC3936(BC)
Q10	4822 130 60667	TR 2SA1532(BC)
Q11	4822 130 60668	TR 2SC3936(BC)
Q12	4822 130 60667	TR 2SA1532(BC)
Q13	4822 130 60668	TR 2SC3936(BC)
Q15	4822 130 60668	TR 2SC3936(BC)
Q16	4822 130 60667	TR 2SA1532(BC)
Q17,18	4822 130 60668	TR 2SC3936(BC)
D1	4822 130 80289	DIODE MA141WK
R1	4822 100 11707	VR 1H DL 10K
R2	4822 116 81525	RES 680 1/16W
R3	4822 116 81482	RES 1K 1/16W
R4	4822 116 81521	RES 5.6K 1/16W
R5	4822 116 81503	RES 2.7K 1/16W
R6	4822 116 81482	RES 1K 1/16W
R7	4822 116 81507	RES 3.3K 1/16W
R8	4822 100 11707	VR CNR BALLA 10K
R9	4822 116 81503	RES 2.7K 1/16W
R10	4822 116 81482	RES 1K 1/16W
R11	4822 116 81507	RES 3.3K 1/16W
R12	4822 100 11707	VR COLOUR DET 10K
R13	4822 116 81516	RES 47K 1/16W
R14	4822 116 81482	RES 1K 1/16W
R15	4822 116 81517	RES 470K 1/16W
R16	4822 116 81483	RES 10K 1/16W
R17,18	4822 116 81482	RES 1K 1/16W
R19	4822 116 81497	RES 3.9K 1/16W
R21	4822 116 81488	RES 1.5K 1/16W
R22	4822 100 11707	VR R/B SEPA 10K
R23	4822 116 81482	RES 1K 1/16W
R24	4822 116 81519	RES 560 1/16W
R26	4822 116 81519	RES 560 1/16W
R27	4822 116 81507	RES 3.3 1/16W
R28	4822 116 81519	RES 560 1/16W
R29	4822 116 81481	RES 100 1/16W
R30	4822 116 81514	RES 470 1/16W
R31	4822 116 81507	RES 3.3K 1/16W
R32	4822 116 81519	RES 560 1/16W
R34	4822 116 81519	RES 560 1/16W
R35	4822 116 81503	RES 2.7K 1/16W
R36	4822 116 81498	RES 22K 1/16W
R37	4822 116 81508	RES 33K 1/16W
R38	4822 116 82174	RES 560K 1/16W
R39	4822 101 10886	RES 100K 1/16W
R40	4822 116 81481	RES 100 1/16W
R42,43	4822 116 81891	RES 27 1/16W
R44-47	4822 116 81481	RES 100 1/16W
R49	4822 116 81507	RES 3.3K 1/16W
R50	4822 116 81488	RES 1.5K 1/16W
R51	4822 116 81511	RES 3.9K 1/16W
R52	4822 116 81488	RES 1.5K 1/16W
R54	4822 116 81865	RES 13K 1/16W
R56	4822 116 81484	RES 1M 1/16W
R57	4822 116 81482	RES 1K 1/16W
R60,61	4822 116 81512	RES 39K 1/16W
R63	4822 116 81495	RES 20K 1/16W
R64	4822 116 81716	RES 2K 1/16W
R65	4822 116 81534	RES 8.2K 1/16W
C1	4822 124 23641	E CAP 10U 16V
C2	4822 126 10055	CAP 0.1U 16V
C3,4	4822 122 33984	CAP 0.01U 25V
C5	4822 126 11428	CAP 1U 16V
C6	4822 124 11177	TAN CAP 2.2U 6.3V
C7	4822 124 23636	E CAP 22U 6.3V
C8	4822 126 10055	CAP 0.1U 16V
C9	4822 124 23641	E CAP 10U 16V
C10	4822 126 10055	CAP 0.1U 16V
C11-13	4822 124 11179	TAN CAP 1U 10V
C14,15	4822 122 33984	CAP 0.01U 25V
C17	4822 126 10055	CAP 0.1U 16V
C18	4822 124 23636	E CAP 22U 6.3V
C19	4822 126 10496	CAP 0.1U 25V
C20	4822 124 11178	TAN CAP 4.7U 6.3V
C21	4822 124 23639	E CAP 100U 6.3V
C22	4822 126 10055	CAP 0.1U 16V
C23	4822 124 23636	E CAP 22U 6.3V
C24	4822 126 10055	CAP 0.1U 16V
C25,26	4822 124 11178	TAN CAP 4.7U 6.3V
C27	4822 124 23636	E CAP 22U 6.3V
C28,29	4822 124 11177	TAN CAP 2.2U 6.3V
C30	4822 124 11178	TAN CAP 4.7U 6.3V
C31	4822 126 10055	CAP 0.1U 16V
C32	4822 124 23636	E CAP 22U 6.3V

C33,34	4822 126 10055	CAP 0.1U 16V
C35	4822 124 23639	E CAP 100U 6.3V
C36	4822 126 10055	CAP 0.1U 16V
C37	4822 124 23636	E CAP 22U 6.3V
C38,39	4822 126 10055	CAP 0.1U 16V
C40	4822 124 23636	E CAP 22U 6.3V
C41	4822 126 10055	CAP 0.1U 16V
C42	4822 122 90082	CAP 220P
C43	4822 124 23636	E CAP 22U 6.3V
C44	4822 126 10055	CAP 0.1U 16V
C45	4822 124 23636	E CAP 22U 6.3V
C46	4822 126 10055	CAP 0.1U 16V
C47,48	4822 126 10109	CAP 56P
C49	4822 125 50407	V CAP OSC 20P
C50	4822 126 11426	CAP 6P
C51	4822 122 90096	CAP 15P
C52	4822 126 10106	CAP 10P
C53,54	4822 126 10055	CAP 0.1U 16V
C55	4822 126 10106	CAP 10P
C56	4822 126 10496	CAP 0.1U 25V
C57	4822 126 10055	CAP 0.1U 16V
C58	4822 124 23636	E CAP 22U 6.3V
C59	4822 126 11424	CAP 39P
L1-12	4822 157 63102	COIL 22UH
LPF1	4822 157 63096	LOW PASS FILTER
LPF2-4	4822 157 63126	LOW PASS FILTER
LPF5	4822 157 63097	LOW PASS FILTER
LPF6,7	4822 157 63095	LOW PASS FILTER

CCD BOARD ASSEMBLY

IC2	4822 209 63776	IC MN3110SA
Q1	4822 130 61084	TR 2SD1819(QR)
Q2	4822 130 61628	TR 2SC4181
D1-3	4822 130 80289	DIODE MA141WK
D5	4822 130 80289	DIODE MA141WK
D6	4822 130 82529	DIODE DA106U
R1	4822 116 81515	RES 4.7K 1/16W
R2-4	4822 101 10886	RES 100K 1/16W
R5	4822 100 11708	VR BLOOMING 100K
R6	4822 116 81494	RES 18K 1/16W
R7	4822 116 81482	RES 1K 1/16W
R8	4822 116 81526	RES 6.8K 1/16W
R9	4822 116 81507	RES 3.3K 1/16W
R10	4822 116 81516	RES 47K 1/16W
R11	4822 100 11709	VR RESET 47K
R12	4822 116 81484	RES 1M 1/16W
R13	4822 116 81504	RES 27K 1/16W
R14	4822 116 81489	RES 15K 1/16W
R15	4822 116 81484	RES 1M 1/16W
C1	4822 124 23642	E CAP 47U 16V
C2	4822 124 23641	E CAP 10U 16V
C3	4822 126 10055	CAP 0.1U 16V
C4	4822 124 23641	E CAP 10U 16V
C5	4822 126 10055	CAP 0.1U 16V
C6	4822 124 23641	E CAP 10U 16V
C7	4822 126 10055	CAP 0.1U 16V
C8	4822 124 11165	TAN CAP 1U 16V
C9-12	4822 126 10055	CAP 0.1U 16V
C13	4822 124 23639	E CAP 100U 6.3V
C14	4822 126 10055	CAP 0.1U 16V
C15	4822 124 23641	E CAP 10U 16V
C16	4822 126 10055	CAP 0.1U 16V
C17	4822 124 23641	E CAP 10U 16V
C18,19	4822 126 10055	CAP 0.1U 16V
C20	4822 122 90052	CAP 0.0022U 50V
C24	4822 126 10496	CAP 0.1U 25V
L1-3	4822 157 63102	COIL 22UH

AF BOARD ASSEMBLY

IC1	4822 209 61053	IC MN12821
IC2	4822 209 63608	IC HA13489MP
IC3	4822 209 63621	IC MN18888JFJS
IC4	4822 209 63616	IC JCY0007
IC5	4822 209 63656	IC MM1036XF
IC6	4822 209 63528	IC LM358DB
IC7	4822 209 70919	IC M5236ML
IC11	4822 209 63526	IC LM324DB
Q1	4822 130 61909	TR 2SB1132(QR)
Q2	4822 130 61903	TR DTA114EU
Q3	4822 130 62607	TR XP5601
Q5	4822 130 62606	TR XP2501
Q6	4822 130 61906	TR DTC114EU
Q11	4822 130 61532	TR 2SB1218(QR)
Q12	4822 130 61084	TR 2SD1819(QR)
D11	4822 130 80289	DIODE MA141WK
D12	4822 130 81385	DIODE MA28WA
R1	4822 116 81482	RES 1K 1/16W
R3	4822 116 81483	RES 10K 1/16W
R5-8	4822 116 81483	RES 10K 1/16W
R9	4822 116 81503	RES 2.7K 1/16W
R10	4822 116 81508	RES 33K 1/16W
R11	4822 116 81483	RES 10K 1/16W
R13	4822 116 81483	RES 10K 1/16W
R15	4822 116 81483	RES 10K 1/16W
R16	4822 116 81526	RES 6.8K 1/16W
R17	4822 116 81503	RES 2.7K 1/16W
R18	4822 116 81521	RES 5.6K 1/16W
R19	4822 116 81527	RES 68K 1/16W
R20	4822 116 81494	RES 18K 1/16W
R21	4822 116 81486	RES 12K 1/16W
R22	4822 116 81483	RES 10K 1/16W
R24	4822 100 11692	VR OFFSET 2.2K
R27	4822 116 81483	RES 10K 1/16W
R28	4822 100 11698	VR GAIN 330K
R29,30	4822 116 81497	RES 2.2K 1/16W
R33	4822 116 81482	RES 1K 1/16W
R35	4822 116 81482	RES 1K 1/16W
R36	4822 116 81525	RES 680 1/16W
R37	4822 116 81506	RES 330 1/16W
R39	4822 116 81482	RES 1K 1/16W
R40	4822 116 81509	RES 390 1/16W
R41	4822 116 81502	RES 270 1/16W
R43	4822 116 81525	RES 680 1/16W
R44	4822 116 81497	RES 2.2K 1/16W
R45	4822 116 81514	RES 470 1/16W
R46	4822 116 81494	RES 18K 1/16W
R47	4822 116 81527	RES 68K 1/16W
R49	4822 116 81483	RES 10K 1/16W
R50	4822 116 81515	RES 4.7K 1/16W
R51	4822 116 81483	RES 10K 1/16W
R52	4822 051 30568	RES 5.6K 1/16W
R53	4822 116 81504	RES 27K 1/16W
R54	4822 116 81494	RES 18K 1/16W
R58-63	4822 116 81483	RES 10K 1/16W
R64,65	4822 101 10886	RES 100K 1/16W
R66-68	4822 116 81503	RES 2.7K 1/16W
R71	4822 116 81493	RES 1.8K 1/16W
R72	4822 116 81514	RES 470 1/16W
R73	4822 116 81497	RES 2.2K 1/16W
R75,76	4822 116 81483	RES 10K 1/16W
R78	4822 116 81534	RES 8.2K 1/16W
R79	4822 116 81495	RES 20K 1/16W
R80,81	4822 116 81494	RES 18K 1/16W
R86	4822 116 81498	RES 22K 1/16W

R90-92	4822 116 81483	RES 10K 1/16W
R93	4822 116 81489	RES 15K 1/16W
R95	4822 116 81496	RES 220 1/16W
R97	4822 116 81483	RES 10K 1/16W
R101	4822 116 81482	RES 1K 1/16W
R102	4822 116 81531	RES 750 1/16W
R104	4822 101 10886	RES 100K 1/16W
R105	4822 116 81521	RES 5.6K 1/16W
R106	4822 116 81497	RES 2.2K 1/16W
R107	4822 100 11692	VR EE LEVEL 2.2K
R108	4822 116 81482	RES 1K 1/16W
R109,10	4822 116 81498	RES 22K 1/16W
R111	4822 116 81482	RES 1K 1/16W
R112,13	4822 116 81483	RES 10K 1/16W
R114	4822 116 81498	RES 22K 1/16W
R115-18	4822 116 81483	RES 10K 1/16W
R119	4822 116 81502	RES 180 1/16W
R130	4822 116 81515	RES 4.7K 1/16W
C1	4822 124 23637	E CAP 22U 6.3V
C2	4822 126 10055	CAP 0.1U 16V
C3	4822 122 33984	CAP 0.01U 25V
C4	4822 124 23637	E CAP 22U 6.3V
C5	4822 126 10055	CAP 0.1U 16V
C6,7	4822 126 10019	CAP 0.047U 16V
C8	4822 124 11172	TAN CAP 4.7U 4V
C9	4822 126 10019	CAP 0.047U 16V
C10	4822 126 10107	CAP 100P
C11	4822 122 90063	CAP 0.022U 16V
C12	4822 126 10019	CAP 0.047U 16V
C13	4822 122 90063	CAP 0.022U 16V
C14	4822 126 10019	CAP 0.047U 16V
C15	4822 122 90063	CAP 0.022U 16V
C16	4822 126 10019	CAP 0.047U 16V
C17	4822 126 10107	CAP 100P
C18	4822 126 10498	CAP 0.027U 50V
C19	4822 126 10107	CAP 100P
C20,21	4822 126 10498	CAP 0.027U 50V
C22	4822 126 10072	CAP 0.01U 50V
C23	4822 126 11397	CAP 120P
C24	4822 126 11398	CAP 150P
C25	4822 126 10055	CAP 0.1U 16V
C26	4822 124 10885	CAP 22P
C27	4822 126 10055	CAP 0.1U 16V
C28,29	4822 122 90083	CAP 33P
C30	4822 122 33984	CAP 0.01U 25V
C31	4822 126 11397	CAP 120P
C32,33	4822 126 10055	CAP 0.1U 16V
C34-36	4822 126 11398	CAP 150P
C37	4822 126 10055	CAP 0.1U 16V
C40,41	4822 126 10055	CAP 0.1U 16V
C43	4822 126 10055	CAP 0.1U 16V
C44	4822 124 23641	E CAP 10U 16V
C45	4822 124 11181	TAN CAP 10U 10V
C46	4822 124 11165	TAN CAP 1U 16V
C47,48	4822 122 33984	CAP 0.01U 25V
C50-54	4822 126 10055	CAP 0.1U 16V
C55	4822 122 33984	CAP 0.01U 25V
C77	4822 122 33984	CAP 0.01U 25V
C78	4822 126 11428	CAP 1U 16V
C79,80	4822 126 10055	CAP 0.1U 16V
L1	4822 157 63133	COIL 47UH
L2	4822 157 63102	COIL 22UH
L3	4822 157 63133	COIL 47UH
L4	4822 157 63129	COIL 33UH
L5	4822 157 63128	COIL 120UH

BPF1	4822 156 21636	BAND PASS FILTER
BPF2	4822 156 21626	BAND PASS FILTER
X1	4822 242 80216	X-TAL RESONATOR
CP1	4822 252 20171	CIRCUIT PROTECTOR

TALLY BOARD ASSEMBLY

D1	4822 130 81323	LED SLH-34VC3F

DISPLAY BOARD ASSEMBLY

R1	4822 116 82929	RES 1.5K 1/10W
R2	4822 116 82931	RES 1.8K 1/10W
L1	4822 157 63127	TOROIDAL COIL
SW1	4822 277 21488	SLIDE SWITCH
SW2-4	4822 271 30751	TACT SWITCH

E.VF BOARD ASSEMBLY

IC1	4822 209 51696	IC AN2512S
IC2	4822 209 63774	IC AN78L05M
Q1	4822 130 60568	TR 2SC2812
Q2	4822 130 62671	TR 2SC4132
D01	4822 130 31742	DIODE DCB010
D02	4822 130 81568	DIODE MA152WK
D03	4822 130 82532	DIODE 1SS244
D04	4822 130 81798	DIODE MA157A
D05	4822 130 80701	DIODE ERA22-08
D06	4822 130 81796	DIODE ESJA04-02
R01	4822 116 81675	RES 47K 1/10W
R02	4822 116 81547	RES 3.9 1/10W
R03	4822 116 82933	RES 39 1/10W
R04	4822 116 82935	RES 510K 1/10W
R06	4822 116 81732	RES 1.2K 1/10W
R07	4822 116 81658	RES 22 1/10W
R08	4822 116 81914	RES 1.2M 1/10W
R09	4822 116 82928	RES 11K 1/10W
R10	4822 116 82165	RES 9.1K 1/10W
R11	4822 116 82934	RES 5.1K 1/10W
R12	4822 116 81646	RES 10K 1/10W
R13	4822 116 81732	RES 1.2K 1/10W
R14	4822 116 81675	RES 47K 1/10W
R15	4822 116 81668	RES 3.3K 1/10W
R16	4822 116 82932	RES 20 1/10W
R17,18	4822 116 82186	RES 3.3M 1/8W
R19	4822 116 81653	RES 1.5K 1/10W
R20	4822 116 81741	RES 68K 1/10W
R21	4822 116 81732	RES 1.2K 1/10W
R22	4822 116 81674	RES 4.7K 1/10W
R23	4822 116 81676	RES 560 1/10W
R40	4822 116 81655	RES 150K 1/10W
VR01	4822 100 11702	VR V.SIZE
VR02	4822 100 11701	VR H.HOLD
VR03	4822 100 11703	VR CONTRAST
VR04	4822 100 11704	VR BRIGHT
C01	4822 124 10899	TAN CAP 50U
C02	4822 122 10532	CAP 1U 16V
C03	4822 122 90043	CAP 0.022U 25V
C04	4822 124 11175	TAN CAP 0.003U
C05	4822 126 11401	CAP 0.1U 50V
C06	4822 122 10532	CAP 1U 16V
C07	4822 124 11173	CAP 0.0024U 100V
C09	4822 124 23014	E CAP 100U 10V
C10	4822 126 11418	CAP 0.3U
C11	4822 124 23166	E CAP 4.7U 50V
C12	4822 124 10898	E CAP 3.3U 50V

C13	4822	126	11402	CAP	220P	16V
C14	4822	126	11403	CAP	0.033U	25V
C15	4822	126	11404	CAP	0.0047U	50V
C16	4822	124	11174	TAN CAP	68U	6.3V
C17	4822	124	22945	E CAP	10U	16V
L01	4822	157	63131	INDUCTOR		
L02	4822	157	63132	H.L.COIL		
TH1	4822	111	91996	THERMISTOR		
T01	4822	148	81153	FB TRANS		
CP1	4822	252	20282	CIRCUIT PROTECTOR		

SECTION 8
TECHNICAL INFORMATIONS

8.1 MECHACON CPU ($\boxed{0}$ $\boxed{1}$ VTR IC301) pin function

Pin No.	Symbol	Label	IN/OUT	Contents
1	P63	V. EE	OUT	VIDEO EE ⟨L⟩/PB ⟨H⟩
2	P62	V. REC	OUT	VIDEO REG (L)
3	P61	PWR LED	OUT	POWER LED ON ⟨L⟩
4	P60	NC	OUT	Not used
5	AN7	CLOG INH	IN	H: No CLOG CHECK
6	AN6	EMG REQ	IN	H: Reg SHORT → POWER OFF
7	AN5	BATT CHK	IN	5.55 V > ALARM, 5.40 V > POWER OFF
8	AN4	DEW SENS	IN	FOR DEW DETECT
9	AN3	AVG FM	IN	FOR DIGITAL TRACKING and CLOG CHECK
10	AN2	KEY SW-B	IN	OPERATION SW
11	AN1	END SENSE	IN	Tape End DETECT
12	AN0	KEY SW-A	IN	OPERATION SW
13	P71	S. SDATA	OUT	SERVO SERIAL DATA
14	P70	S. SCLK	OUT	SERVO SERIAL CLOCK
15	P37	C. SRDY	IN	CAMERA SERIAL READY (L)
16	SCLK	C. SCLK	OUT	CAMERA SERIAL DATA TRANSFER CLOCK
17	SOUT	C. SSD	OUT	SERIAL DATA TRANSMISSION TO CAMERA
18	SIN	C. SRD	IN	SERIAL DATA FROM CAMERA
19	CNTR	CAP FG	IN	FOR TAPE REMAIN and PB SP/EP DETECT
20	INTZ	KEY SW-C	IN	PWR, EJECT, REC SAFE SW
21	P31	GND	IN	Not used
22	P30	S. LOCK	IN	SERVO LOCK (L)
23	INT1	DRUM FF	IN	DRUM ROTATION DETECT
24	CNVss	GND	IN	
25	RESET	RESET	IN	POWER ON RESET (L)
26	Xin	4MHz	IN	} CPU CLOCK
27	Xout	4MHz	OUT	
28	ϕ	NC	OUT	
29	Vss	GND	IN	
30	ED7	MODE-D	IN	REC START/STOP TIMING DETECT
31	ED6	PB CTL PULSE	IN	PB SP/EP DETECT
32	ED5	REC SAFE SW	IN	ON (L)/OFF (H)
33	ED4	SUP SENS	IN	SUPPLY REEL ROTATION and TAPE REMAIN DET
34	P53	TU SENS	IN	TU REEL ROTATION DETECT
35	P52	POWER SW	IN	ON ⟨L⟩/OFF ⟨H⟩
36	P51	EJECT SW	IN	ON ⟨L⟩/OFF ⟨H⟩
37	P50	TRG SW	IN	ON (L)/OFF (H)
38	P17	END LED ON ⟨H⟩	OUT	
39	P16	TAPE SELECT	IN	L : NORMAL, H : LONG LENGTH
40	P15	TRK A/M	IN	TRACKING L : MANUAL, H : AUTO
41	P14	TRK +	IN	TRACKING UP } MANLAL
42	P13	TRK −	IN	TRACKING DOWN
43	P12	CAM SW-A	IN	} MECHANISM MODE DETECT
44	P11	CAM SW-B	IN	
45	P10	CAS SW	IN	HOUSING LOCK (L)
46	P75	S. ENBL	IN	Not used
47	P74	TEST 11	IN	} (L, L) No EMERGENCY CHECK
48	P73	TEST 00	IN	(H, H) NORMAL
49	P72	S. ENVELOP	OUT	CLOG CHECK (H)
50	P07	V. SW OFF	OUT	VIDEO HEAD SW OFF (H)
51	P06	SYNC CHANG	OUT	CAMERA ON (H) FOR OSD
52	P05	V PLS ON	OUT	V. PULSE ON ⟨H⟩
53	P04	V. REC MUTE	OUT	VIDEO REC MUTE ⟨L⟩
54	P03	V. ALL MUTE	OUT	VIDEO OUTPUT MUTE ⟨H⟩
55	P01	V. PB	OUT	VIDEO PB ⟨H⟩/EE ⟨L⟩
56	P01	A. MUTE	OUT	AUDIO OUT MUTE ⟨H⟩

Pin No.	Symbol	Label	IN/OUT	Conterts
57	P00	A. PB	OUT	AUDIO PB (L)/EE (H)
58	P27	TRG OUT	OUT	REMOTE PAUSE(H)
59	P26	EP/SP	OUT	EP (H)/SP (L)
60	P25	ALM ON	OUT	TRIGGER ALARM ON (H)
61	P24	LD REV	OUT	MODE CTL MOTOR REV (H)
62	P23	LD FWD	OUT	MODE CTL MOTOR FWD (H)
63	P22	DECK PWR CTL	OUT	POWER ON (H)
64	P21	FEH ON	OUT	FLYING ERASE HEAD ON (H)
65	Vss	GND		
66	P20	CTL ERS	OUT	CTL ERASE HEAD ON (H)
67	Vcc	AL5V		
68	AVss	GND		
69	VREF	REG5V		
70	D/A	CAP M REF	OUT	FF, REW REEL DRIVE VOLTAGE OUTPUT
71	PWM	NC	OUT	
72	P64	A. BIAS	OUT	AUDIO REC BIAS ON (H)

8.2 Automatic operation of mechacon

1. Tape end detection
   When the end sensor is turned on as the capstan motor is rotating in the FF direction, the mechanism is shifted to the Unloading Stop mode.
   In the FF mode, tape end is detected by the reel sensor.
2. Tape start detection
   When REEL FG signal does not vary for more than 2 sec as the capstan motor is rotating in the REW direction, the mechanism is shifted to the Loading Stop mode.
   In the REW mode, this operation shifts the mechanism to the Unloading Stop mode.
3. Drum rotation detection
   When DRUM FF signal does not vary for more than 2 sec in a mode that the drum must be rotating, the mechanism is shifted to the Unloading Stop mode and the related emergency number is displayed in the electronic viewfinder.
4. Reel rotation detection
   When REEL FG signal does not vary for a time longer than that described below in a mode that the reel must be rotating, the mechanism is shifted to the Unloading Stop mode and the related emergency number is displayed in the electronic viewfinder.

	Supply Reel FG	Take-up Reel FG
REC/PB	10.0 sec	4.2 sec
Preroll	4.2 sec	10.0 sec
Search FF	2.0 sec	2.0 sec

5. Capstan rotation detection
   When no output of CAPSTAN FG signal is obtained in the Assembly Edit mode, the mechanism is shifted to the Unloading Stop mode and the related emergency number is displayed in the electronic viewfinder.
6. Control pulse detection
   When no output of control pulse signal is obtained in recording of VISS code with an optional remote control unit, the mechanism is shifted to the Unloading Stop mode and the related emergency number is displayed in the electronic viewfinder.
7. Loading/Unloading overtime
   If loading operation does not finish with 10 sec after the Loading/Unloading operation started, the operation is stopped and the related emergency number is displayed in the electronic viewfinder.
8. Power-saving
   - When the machine is left in the Stop mode approximately for more than 5 minutes, the power is automatically turned off except in the Rehearsal mode.
   - When the machine is left in the PB Pause mode approximately for more than 5 minutes, the mechanism is shifted to the Stop mode and the power is turned off another 5 minutes after.
   - When the machine is left in the REC Pause mode approximately for more than 5 minutes, the mechanism is shifted to the REC Lock mode and then the power is turned off.

8.3 EMERGENCY DISPLAY

Whenever some abnoral signal is supplied to mechacon CPU, the POWER LED will be flickered and an error number (E05, for example) displayed on the electronic view finder.

E. VF DISPLAY	Symptom	Mode when observed	Resulting mode
E 06	CAPSTAN FG input absent	EDIT	STOP
E 05	PB CTL PULSE input absent	EDIT	STOP
E 04	DRUM FF input absent	DRUM rotation	STOP
E 03	REEL FG input absent	REC, PLAY, SEARCH FF	STOP
E 02	Mode control motor rotates for more than 10 sec. without shift to next mode.	UNLOADING	Mode continues
E 01	Mode control motor rotates for more than 10 sec. without shift to next mode.	LOADING	Mode continues

Emergency mode : Indication for 5 minutes, then power OFF
Port states : Same as Stop mode
Effective key : POWER
Shifted mode : Power OFF

8.4 SERVO LSI (0 1 VTR IC101) Pin function

Pin No.	Label	I/O	Description	Pin No.	Label	I/O	Description
1	ADV	O	Tracking correction pulse output	29	VDD	–	System power source
2	CAP CTL	O	Control mode switching (CPU/SERVO mode)	30	M-D	O	Drum phase monitor output
3	SP	O	Mode switching (SP mode) signal output	31	M-C	O	Capstan phase monitor output
4	FM EMV	I	Internal sync signal switching (sync/non-sync)	32	SEL 2	I	Setup terminal (Head setting)
5	CPU	O	Capstan phase control PWM output	33	SEL 1	I	(Same as above)
6	CFV	O	Capstan speed control PWM output	34	NC	–	NC
7	BRK	O	Capstan brake control	35	NC	–	NC
8	FWD	O	Normal/Reverse rotation of capstan	36	NC	–	NC
9	WIDE	O	CTL pulse rewrite control signal	37	NC	–	NC
10	WRITE	O	(Same as above)	38	NC	–	NC
11	DUTY	O	REC control duty control	39	D ON	O	Drum on input
12	TEST	O	TEST terminal (NC)	40	SW MM	I/O	PG MM terminal
13	FOSC	O	Reference signal input	41	D FG/PG	I	Drum PG/FG input
14	GND	–	GND	42	GND	–	GND
15	YNR	O	YNR pulse output	43	DPV	O	Drum phase control PWM output
16	VP ON	O	V pulse on/off mode control	44	DFV	O	Drum speed control PWM output
17	VP	O	V sync (false pulse) output	45	GD	O	NC
18	SYNC	I	V sync input	46	ASWD	O	Audio head switching pulse output (A SW D)
19	FRAME	I	Frame pulse input	47	ASWC	O	″ (A SW C)
20	AV REC	I	Camera/External input mode switching	48	ASWB	O	″ (A SW B)
21	S OUT	O	Servo lock control	49	ASWA	O	″ (A SW A)
22	C FG	I	Capstan FG input	50	A FF	O	″ (A FF)
23	CTL P	I	Control pulse input	51	VSWD	O	Video head switching pulse output (R SW D)
24	D FF	O	Drum flipflop	52	VSWC	O	″ (V SW C)
25	S CLK	I	Serial data input	53	VSWB	O	″ (V SW B)
26	S DATA	I	Data transfer clock input	54	VSWA	O	″ (V SW A)
27	EP DL	–	NC	55	H FF	O	″ (H FF)
28	PW ON	I	Reset terminal	56	V FF	O	″ (V FF)

Special functions of servo IC

1. To fix DRUM PHASE OUT (pin 43)
   - When DRUM FG frequency comes off the tolerance of ±10%.
2. To fix CAPSTAN PHASE OUT (pin 5)
   - When DRUM FG frequency comes off the tolerance of ±10%.
   - When CAPSTAN FG frequency comes off the tolerance of ±10%.
   - When 2 or more PB CTL pulses drop out in playback.
   - In the Pause mode
3. DRUM POWER UP (pin 34)
   - To output High potential when DRUM FG frequency is −17% of or lower than the specified value.
   - To output Low potential when DRUM FG frequency is −12% of or higher than the specified value.
4. CAPSTAN POWER UP (pin 35)
   - To output High potential when CAPSTAN FG frequency is −10% of or lower than the specified value.
   - To output Low potential when DRUM FG frequency is −7% of or higher than the specified value.
   - To output High potential in the Search or Retake-REV mode.
   - To output Low potential in the Pause mode.
5. SERVO LOCK OUT (pin 21)
   - To output Low potential when sampling both of the DRUM and CAPSTAN phases are performed for 4 frames in the slope period.
6. MONITOR OUT (pins 30, 31)
   - To output sampling pulses of the DRUM and CAPSTAN phases in double in the slope period of the trapezoidal waveform.

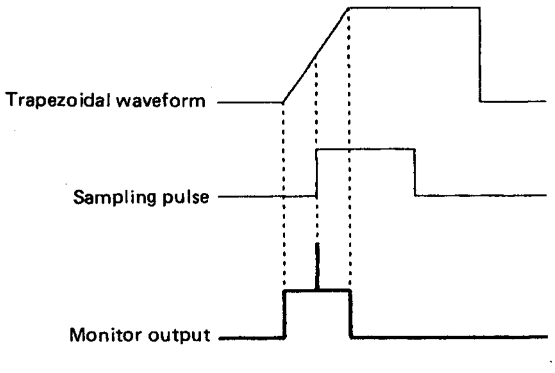


Fig. 3-2-2 Monitor output

8.5 CAMERA CPU (1 1 CPU IC1) Pin function

Pin No.	Symbol	Label	IN/OUT	Contents								
1	DA3	WHITE BAL R GAIN CTL	OUT	RED LEVEL CONTROL								
2	DA2	WHITE BAL B GAIN CTL	OUT	BLUE LEVEL CONTROL								
3	DA1	COLD FL or WARM FL (H)	OUT	B-Y LEVEL DOWN WHEN FL MODE								
4	DA0	Y GAIN UP (L)	OUT	Y GAIN UP WHEN LOW LIGHT								
5	AN7	W. BAL R/G, B/G, YL	IN	WHITE BALANCE SENSOR VOLTAGE INPUT								
6	AN6	OPERATION SW4	IN	DATE/TIME SET (+), (−), SELECT								
7	AN5	OPERATION SW3	IN	DISPLAY, MODE, SHUTTER, FADER, FULL AUTO								
8	AN4	OPERATION SW2	IN	TITLE, COLOR, TITLE MEMORY, NEGA/POGI/CINEMA								
9	AN3	OPERATION SW1	IN	RESET, MEMORY, FOCUS								
10	AN2	GND	–									
11	AN1	GND	–									
12	AN0	GND	–									
13	INT3	GND	–									
14	INT2	FL FLICKER PULSE	IN	FOR FL FLICKER DETECT								
15	INT1	CAMERA POWER ON (L)	IN									
16	INT0	REG 5V DOWN (L)	IN	ENTER THE CPU STOP MODE								
17	SRDY2	AF READY (H)	IN									
18	SCLK2	AF SERIAL CLOCK	OUT	AF-CPU SERIAL DATA TRANSFER CLOCK								
19	SOUT2	AF SERIAL DATA	OUT	8 bits								
20	SIN2	AF SERIAL DATA	IN	8 bits								
21	SRDY1	S. READY (L)	OUT									
22	SCLK1	DECK SERIAL CLOCK	IN	DECK CPU SERIAL DATA TRANSFER CLOCK								
23	SOUT1	DECK SERIAL DATA	OUT	8 bita								
24	SIN1	DECK SERIAL DATA	IN	8 bits								
25	XCIN	32.768 KHz	IN	TIME & DATE CLOCK								
26	XCOUT	32.768 KHz	OUT									
27	CNVSS	GND	–									
28	ϕ	NC	–									
29	RESET	RESET (L)	IN									
30	XIN	4 MHz	IN	CPU CLOCK								
31	XOUT	4 MHz	OUT									
32	VSS	GND	–									
33	P27	IRIS CLOSE (H)	OUT	STOP or FF/REW (H)								
34	P26	JIG (L)	IN	FOR EVR ADJUSTER								
35	P25	TALLY LAMP ON (H)	OUT									
36	P24	RELL FG PULSE	IN	FOR E. VF TAPE COUNTER DISPLAY								
37	P23	REC MODE (L)	OUT									
38	P22	WB SENSOR CTL-1	OUT	WHITE BALANCE SENSOR OUTPUT SELECT								
39	P21	WB SENSOR CTL-2	OUT									
40	P20	WB SENSOR CTL-3	OUT									
41	P17	MEMORY S. DATA IN	IN	EEPROM READ DATA IN								
42	P16	MEMORY S. DATA OUT	OUT	EEPROM WRITE DATA OUT								
43	P15	MEMORY S. CLOCK	OUT	EEPROM SERIAL CLOCK								
44	P14	MEMORY CHIP SELECT (H)	OUT									
45	P13	TITLE CTL S. CLOCK	OUT	TITLE CONTROL DATA OUTPUT								
46	P12	TITLE CTL S. DATA	OUT									
47	P11	TITLE CTL CS (L)	OUT									
48	P10	TITLE S. RAM CS (H)	OUT	S. RAM BACK UP (L), TITLE MEMORY or TITLE ON (H)								
49	P07	FADE MODE-2	OUT	Not used								
50	P06	FEDE MODE-1	OUT									
				SHUTTER MODE	**1/50**	1/125	1/250	1/500	1/1000	1/2000	1/4000	**1/60**
51	P05	SHUTTER-3	OUT		L	L	L	L	H	H	H	H
52	P04	SHUTTER-2	OUT		L	L	H	H	L	L	H	H
53	P03	SHUTTER-1	OUT		L	H	L	H	L	H	L	H
54	P02	LOW LIGHT (L)	IN	IRIS OPEN (L)								

PIN No.	SYMBOL		IN/OUT	CONTENS
55	P01	L. BATT DOWN (L)	IN	FOR E. VF DISPLAY
56	P00	JIG ENABLE (H)	IN	FOR EVR ADJUSTER
57	P37	GND	—	
58	P36	GND	—	
59	P35	CINEMA MODE (H)	OUT	
60	P34	FL FLICKER PULSE	IN	FOR FL FLICKER DETECT
61	P33	(H)	IN	
62	P32	(L)	IN	
63	P31	CAMERA POWER ON (H)	OUT	
64	OUT2	FRING PULSE	OUT	FOR TIME & DATE DISPLAY
65	OUT1	NC	—	
66	I	NC	—	
67	B	CHARACTOR PULSE	OUT	FOR TIME & DATE DISPLAY
68	G	CHARACTOR PULSE	OUT	FOR E. VF DISPLAY
69	R	NC	IN	
70	OSC1	6MHz	IN	DISPLAY CLOCK OSC WITH BLANKING
71	OSC2	6MHz	OUT	
72	VCC	UNSW 5V	—	
73	VSS	GND	—	
74	VSYNC	VD	IN	
75	HSYNC	HD	IN	
76	AVCC	REG 5V	—	
77	AVSS	GND	—	
78	VREF	REG 5V	—	
79	DA5	VIDEO FADE	OUT	FADE CONTROL VOLTAGE OUTPUT
80	DA4	AUDIO FADE	OUT	

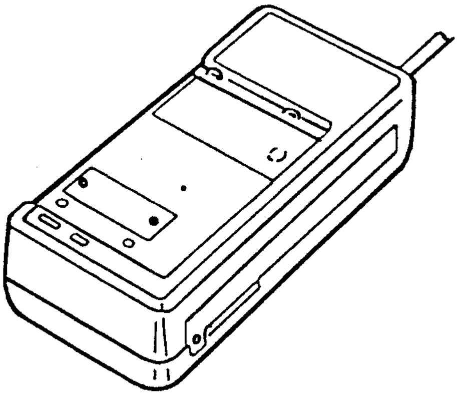
8.6 AUTO FOCUS CPU (1 5 AF IC3) Pin function

Pin No.	Symbol	Label	IN/OUT	Contents
1	ADC2	ZOOM ENCODER	IN	ZOOM LENS POSITION DETECT
2	ADC1	IRIS SENSOR	IN	IRIS SIZE DETECT
3	ADC0	AF SIGNAL	IN	CONTRAST VOLTAGE
4	VREF−	1V	—	
5	S/H2	ADSH	—	S/H CAPACITOR FOR A/D CONV
6	AVSS	GND	—	
7	P67	NC	—	
8	P66	AF MOTOR PS (H)	OUT	POWER SAVE CTL WHEN MOTOR STOP
9	P65	AF V-WINDOW PULSE	OUT	V. BLANKING PULSE OUTPUT FOR AF SIGNAL
10	P64	NC	—	
11	P63	AF MOTOR FAR (L)	OUT	AF MOTOR DRIVE
12	P62	AF MOTOR NEAR (L)	OUT	
13	P61	AF PROCESSER CLK	OUT	AF PROCESSER CH & GAIN DATA 13 bits
14	P60	AF PROCESSER DATA	OUT	
15	EX1	GND	—	
16	P57	ZOOM WIDE (H)	OUT	ZOOM MOTOR DRIVE
17	P56	ZOOM TELE (H)	OUT	
18	P55	NC	—	
19	P54	∞ SENSOR ON (L)	OUT	LOW WHEN MASTER LENS ∞ POSITION CHECK
20	P53	SERIAL READY (H)	OUT	
21	P52	NC	—	
22	P51	NC	—	
23	P50	NC	—	
24	RST−	RESET (L)	IN	
25	OSC1	8MHz	IN	SYSTEM CLOCK
26	OSC2	8MHz	OUT	
27	VSS	GND	—	
28	P23	NC	—	
29	P27	HD	IN	
30	P26	NC	—	
31	P25	NC	—	
32	P24	VD	IN	
33	P22	AF H-WINDOW PULSE	OUT	H. BLANKING PULSE OUTPUT FOR AF SIGNAL
34	P21	NC	—	
35	P20	HD	IN	
36	P07	CPU-AF S. CLOCK	IN	SERIAL DATA TRANSFER CLOCK
37	P06	CPU-AF S. DATA	IN	8 bits
38	P05	CPU-AF S.DATA	OUT	8 bits
39	P01	NC	—	
40	P00	NC	—	
41	P47	FAR SW ON (L)	IN	
42	P46	NEAR SW ON (L)	IN	
43	P45	WIDE SW ON (L)	IN	
44	P44	TELE SW ON (L)	IN	
45	P43	ADJUST MODE (L)	IN	
46	P42	V. REC (L)	IN	
47	P41	(H)	IN	
48	P40	(H)	IN	
49	P77	NC	—	
50	P76	NC	—	
51	P75	NC	—	
52	P74	NC	—	
53	P73	NC	—	
54	P72	NC	—	
55	P71	NC	—	
56	P70	NC	—	

Pin No.	Symbol	Label	IN/OUT	Contents
57	VDD	LOGIC 5V	—	FOR DIGITAL CIRCUIT
58	AVDD	ANALOG 5V	—	FOR ANALOG CIRCUIT
59	VREF+	4V	—	FOR D/A CONV and A/D CONV
60	DAC1	NC	—	
61	S/H1	DASH1	—	S/H CAPACITOR FOR D/A CONV-1
62	DAC0	ZOOM SPEED	OUT	SPEED UP WHEN AUTO MACHRO
63	S/H0	DASH0	—	S/H CAPACITOR FOR D/A CONV-0
64	ADC3	∞ SENSOR	IN	MASTER LENS ∞ POSITION DETECT

SECTION 9

AC Adaptor
SBC5423



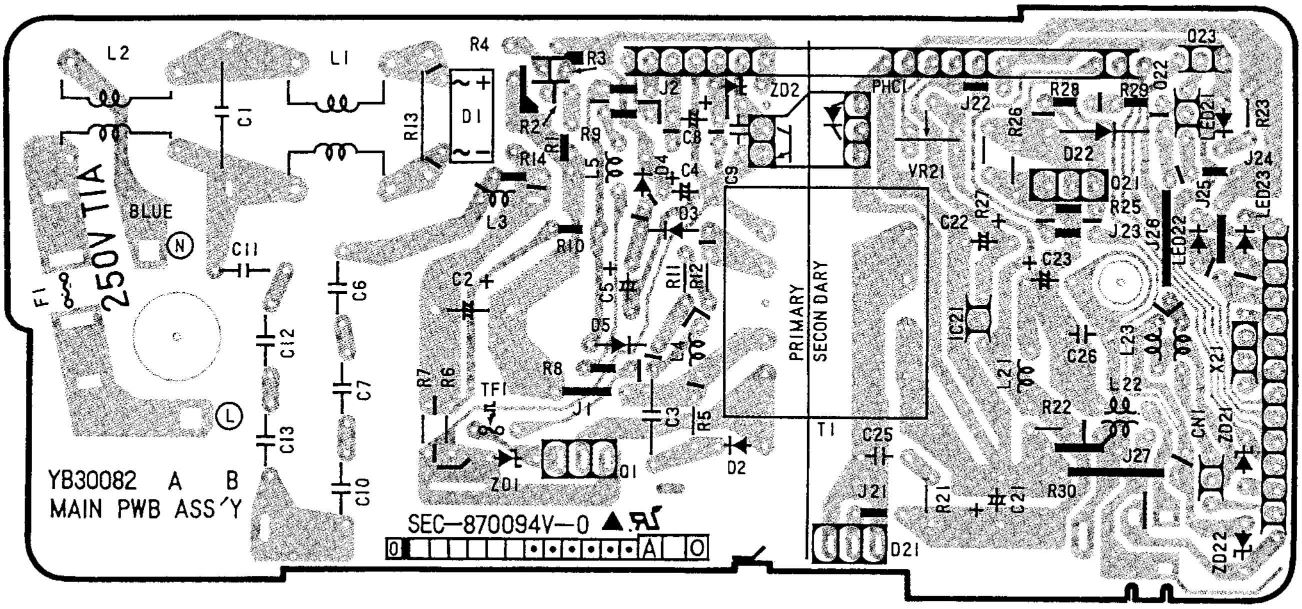
Specifications

Power requirement	: AC 110 - 240 V, 50/60 Hz
Power consumption	: 22 W
Output	: DC 8.5 V, 1.3 A (charge) DC 6.0 V, 1.8 A (Camcorder)
Charging system	: Constant current, peak detection, timer controlled
Dimensions	: 145(W) x 42(H) x 69(D) mm
Weight	: Approx. 380 g

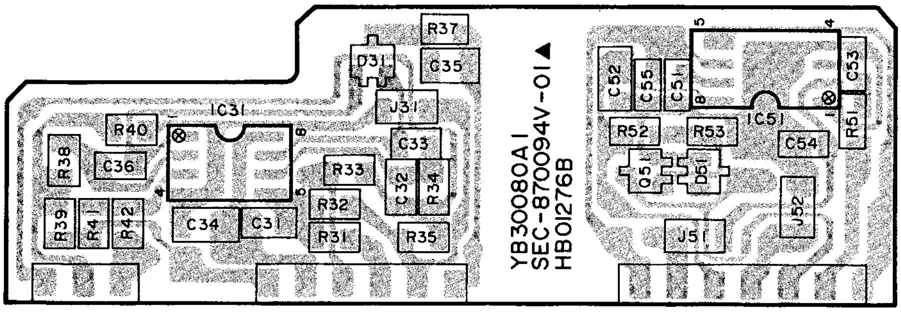
*** Design and specifications subject to change without notice.**

9.1 MAIN/SUB & SW CIRCUIT BOARDS

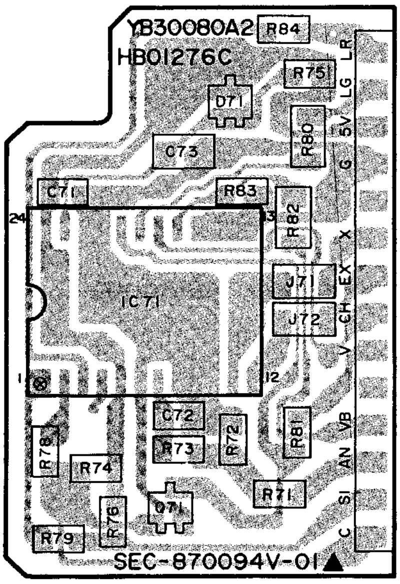
– MAIN CIRCUIT BOARD –


L2
L1
R4
R3
J2
ZD2
PHC1
D23
R28
R29
Q22
J22
R26
LED21
R23
R13
D1
R2
R9
C8
C9
R1
R14
L5
D4
C4
D22
J24
C1
BLUE
250V T1A
L3
R10
D3
VR21
Q21
R25
J25
C22
R27
J23
J26
LED22
LED23
F1
C11
C6
C2
C5
R11
R12
C23
IC21
PRIMARY
SECONDARY
C12
D5
L4
C26
L23
X21
R7
R6
TF1
R8
C7
J1
C3
R5
L21
L22
R22
CN1
ZD21
C13
T1
C25
J27
YB30082 A B
MAIN PWB ASS'Y
ZD1
Q1
D2
J21
R21
C21
R30
C10
SEC–870094V–0
A
D21
ZD22

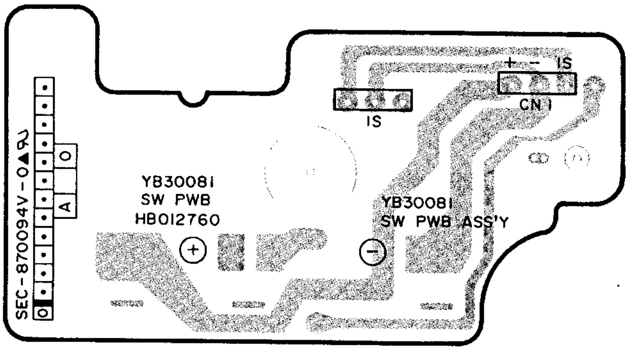
– SUB (1) CIRCUIT BOARD –


R37
D31
C35
J31
IC31
R40
R38
C36
C33
R33
C32
R34
R39
R41
R42
C34
C31
R32
R31
R35
YB30080A1
SEC-870094V-01
HB01276B
C52
C55
C51
IC51
C53
R52
R53
C54
R51
Q51
D51
J52
J51

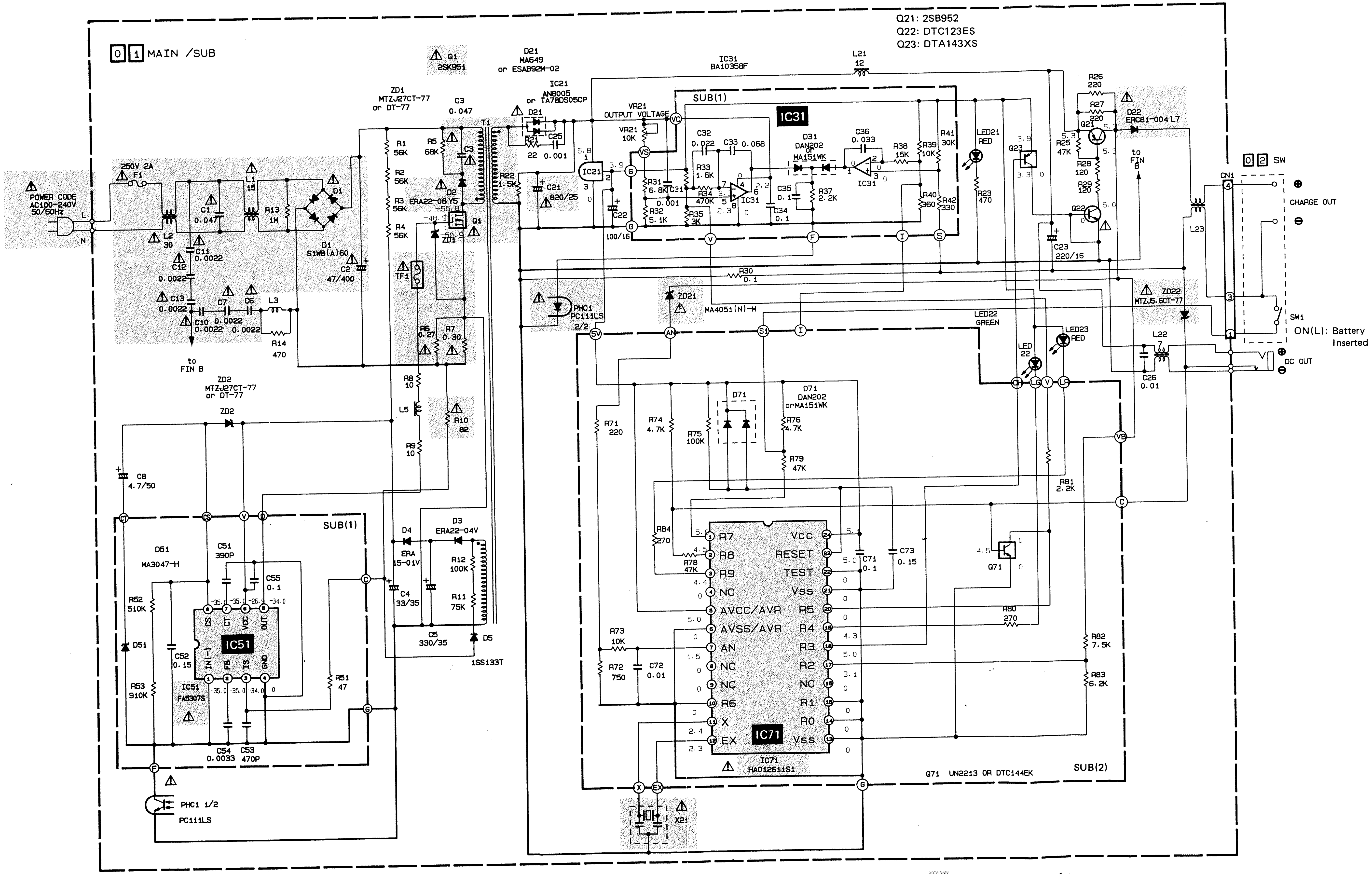
– SUB (2) CIRCUIT BOARD –


YB30080A2
HB01276C
R84
R75
D71
C73
R80
C71
R83
R82
IC71
J71
J72
LR
LG
5V
G
X
EX
CH
V
VB
AN
SI
C
C72
R73
R72
R81
R78
R74
R71
R76
Q71
R79
SEC-870094V-01

– SW CIRCUIT BOARD –


IS
CN1
+ – IS
SEC-870094V-0
A
YB30081
SW PWB
HB012760
YB30081
SW PWB ASS'Y
+
–

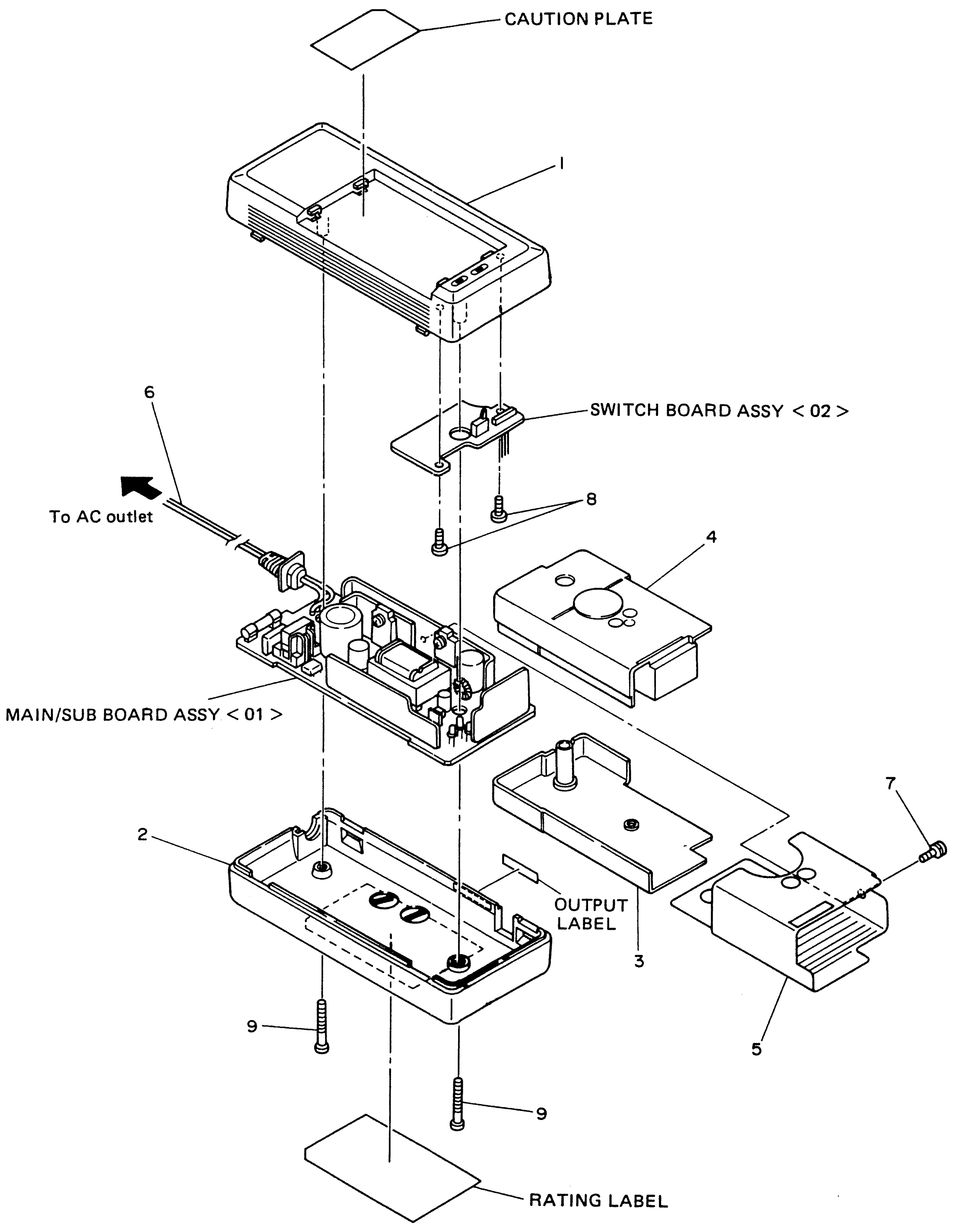
9.2 MAIN/SUB & SW SCHEMATIC DIAGRAMS


0 1 MAIN /SUB
Q21: 2SB952
Q22: DTC123ES
Q23: DTA143XS
POWER CODE
AC100-240V
50/60Hz
250V 2A
F1
L
N
L2
30
C11
0.0022
C12
0.0022
C13
0.0022
C1
0.047
L1
15
R13
1M
D1
S1WB(A)60
C2
47/400
C7
C6
L3
C10 0.0022
0.0022 0.0022
R14
470
to
FIN B
Q1
2SK951
ZD1
MTZJ27CT-77
or DT-77
C3
0.047
R1
56K
R2
56K
R3
56K
R4
56K
R5
68K
D2
ERA22-06Y5
TF1
R6
0.27
R7
0.30
R8
10
L5
R9
10
R10
82
T1
D21
MA649
or ESAB92M-02
IC21
AN8005
or TA78DS05CP
R21
22
C25
0.001
R22
1.5K
C21
820/25
C22
100/16
VR21
OUTPUT VOLTAGE
VR21
10K
IC31
BA10358F
SUB(1)
IC31
C32
0.022
C33 0.068
R31
6.8K
C31
0.001
R32
5.1K
R33
1.6K
R34
470K
R35
3K
C35
0.1
C34
0.1
R37
2.2K
D31
DAN202
or
MA151WK
C36
0.033
R38
15K
R39
10K
R41
30K
R40
360
R42
330
L21
12
LED21
RED
R23
470
Q23
R26
220
R27
220
Q21
R25
47K
R28
120
R29
120
D22
ERC81-004 L7
to
FIN
Q22
C23
220/16
L23
0 2 SW
CN1
CHARGE OUT
⊕
⊖
SW1
ON(L): Battery
Inserted
DC OUT
L22
7
C26
0.01
ZD22
MTZJ5.6CT-77
R30
0.1
PHC1
PC111LS
2/2
ZD21
MA4051(N)-M
LED22
GREEN
LED23
RED
LED
22
ZD2
MTZJ27CT-77
or DT-77
C8
4.7/50
D51
MA3047-H
C51
390P
C55
0.1
R52
510K
D51
C52
0.15
R53
910K
IC51
FA5307S
IC51
CS
CT
VCC
OUT
IN(-)
FB
IS
GND
C54
0.0033
C53
470P
R51
47
SUB(1)
D4
ERA
15-01V
C4
33/35
D3
ERA22-04V
R12
100K
R11
75K
C5
330/35
D5
1SS133T
PHC1 1/2
PC111LS
R71
220
R74
4.7K
R75
100K
D71
D71
DAN202
orMA151WK
R76
4.7K
R79
47K
R84
270
R78
47K
R73
10K
R72
750
C72
0.01
C71
0.1
C73
0.15
IC71
R7
R8
R9
NC
AVCC/AVR
AVSS/AVR
AN
NC
NC
R6
X
EX
Vcc
RESET
TEST
Vss
R5
R4
R3
R2
NC
R1
R0
Vss
IC71
HA012611S1
Q71
R80
270
R81
2.2K
R82
7.5K
R83
6.2K
Q71 UN2213 OR DTC144EK
SUB(2)
X2

- Shaded ( ) parts are critical for safety.
  Replace only with specified part numbers.

9.3 CABINET ASSEMBLY AND PARTS LIST

< M2 > CABINET ASSEMBLY



AC POWER ADAPTOR

CABINET ASSEMBLY

Pos.	Parts code	Description
A1	4822 272 10286	AC POWER ADAPTER
1	4822 432 60549	UPPER CASE
2	4822 432 60546	LOWER CASE
3	4822 432 60547	SHIELD PLATE(LOWER)
4	4822 432 60548	SHIELD PLATE(UPPER)
5	4822 325 20224	INSULATOR
6	4822 321 10742	AC POWER CORD

ELECTRICAL PARTS LIST

MAIN/SUB BOARD ASSEMBLY

Pos.	Parts code	Description
IC21	4822 209 70946	IC AN8005
Q1	4822 130 62672	FET 2SK951
Q21	4822 130 61492	TR 2SB952
Q22	4822 130 62668	TR DTC123ES
Q23	4822 130 62261	TR UN411F
D1	4822 130 82059	BRIDGE DIODE S1WB
D2	4822 130 80701	DIODE ERA22-08Y5
D3	4822 130 81256	DIODE ERA22-04V
D4	4822 130 81359	DIODE ERA15-01V
D5	4822 130 32778	DIODE 1SS133T
D21	4822 130 81263	DIODE MA649
D22	4822 130 32709	DIODE ERC81-004L7
ZD1,2	4822 130 82531	DIODE MTJ27CT-77
ZD21	4822 130 33935	DIODE MA4051(N)-M
ZD22	4822 130 82534	DIODE MTZ5.6CT-77
LD1	4822 130 82537	LED (RED)
LD2	4822 130 82536	LED (GREEN)
LD3	4822 130 82537	LED (RED)
PHS1	4822 130 82535	PHOTO COUPLER,PHC1
R1-4	4822 111 30952	RES 56K 1/4W
R5	4822 116 60557	RES 68K 6W
R6	4822 116 82942	RES 0.27 1/2W
R7	4822 116 80537	RES 0.30 1/2W
R8,9	4822 116 52176	RES 10 1/4W
R10	4822 111 30953	RES 82 1/4W
R11	4822 116 52301	RES 75K 1/4W
R12	4822 116 52234	RES 100K 1/4W
R13	4822 111 30954	RES 1M 1/8W
R14	4822 116 52224	RES 470 1/4W
R21	4822 116 52186	RES 22 1/2W
R22	4822 111 30949	RES 1.5K 1/4W
R23	4822 116 52224	RES 470 1/4W
R25	4822 111 30951	RES 47K 1/4W
R26,27	4822 116 60556	RES 220 1W
R28,29	4822 111 30948	RES 120 1/4W
R30	4822 116 82943	RES 0.1 1W
VR21	4822 100 11706	VR OUTPUT VOLT 10K
C1	4822 126 11436	CAP 0.047U 250V
C2	4822 124 23654	E CAP 47U 400V
C3	4822 126 11432	CAP 0.047U
C4	4822 124 23655	E CAP 33U 35V
C5	4822 124 23656	E CAP 330U 35V
C6	4822 126 11437	CAP 0.0022U
C7	4822 126 11438	CAP 0.0022U
C8	4822 124 23657	E CAP 4.7U 50V
C10	4822 124 23662	E CAP 0.0022U
C11	4822 124 23663	E CAP 0.0022U
C12	4822 124 23664	E CAP 0.0022U
C13	4822 124 23665	E CAP 0.0022U
C21	4822 124 23658	E CAP 820U 25V
C22	4822 124 23659	E CAP 100U 16V
C23	4822 124 23661	E CAP 220U 16V
C25	4822 126 11433	CAP 0.001U
C26	4822 126 11434	CAP 0.001U
L1	4822 157 63143	COIL 15mH
L2	4822 157 63144	COIL 30mH
L3	4822 157 63147	COIL
L5	4822 157 63148	COIL
L21	4822 157 63145	CHOKE COIL 12UH
L22	4822 157 63146	CHOKE COIL 7UH
L23	4822 157 63149	COIL
X21	4822 242 80218	X-TAL RESONATOR
T1	4822 148 81155	SWITCHING TRANS
J1	4822 267 31326	DC JACK
TF1	4822 252 20283	THERMAL FUSE
F1	4822 253 30365	FUSE

SUB BOARD (1) ASSEMBLY

Pos.	Parts code	Description
IC31	4822 209 63785	IC BA10358F
IC51	4822 209 63786	IC FA5307S
D31	4822 130 31742	DIODE DAN202
D51	4822 130 81257	DIODE MA3047-H
R31	4822 116 81681	RES 6.8K 1/10W
R32	4822 116 82934	RES 5.1K 1/10W
R33	4822 116 82945	RES 1.6K 1/10W
R34	4822 116 81739	RES 470K 1/10W
R35	4822 116 82946	RES 3K 1/10W
R37	4822 116 81659	RES 2.2K 1/10W
R38	4822 116 81654	RES 15K 1/10W
R39	4822 116 81646	RES 10K 1/10W
R40	4822 116 82947	RES 360 1/10W
R41	4822 116 81737	RES 30K 1/10W
R42	4822 116 81667	RES 330 1/10W
R51	4822 116 82938	RES 47 1/10W
R52	4822 116 82939	RES 510K 1/10W
R53	4822 116 82941	RES 910K 1/10W
C31	4822 126 11435	CAP 0.001U
C32	4822 126 11416	CAP 0.002U
C33	4822 126 11417	CAP 0.068U
C34	4822 124 23662	CAP 0.1U
C35	4822 126 11411	CAP 0.1U
C36	4822 126 11412	CAP 0.033U
C51	4822 126 11405	CAP 390P
C52	4822 126 11406	CAP 0.15U
C53	4822 126 11407	CAP 470P
C54	4822 126 11408	CAP 0.0033U
C55	4822 126 11409	CAP 0.1U

SUB BOARD (2) ASSEMBLY

IC71	4822 209 62278	IC HA02611S1
Q71	4822 111 90815	TR UN2213
D71	4822 130 31742	DIODE MA151WK
R71	4822 116 81546	RES 220 1/10W
R72	4822 116 82404	RES 750 1/10W
R73	4822 116 81646	RES 10K 1/10W
R74	4822 116 81674	RES 4.7K 1/10W
R75	4822 116 81647	RES 100K 1/10W
R76	4822 116 81674	RES 4.7K 1/10W
R78,79	4822 116 81675	RES 47K 1/10W
R81	4822 116 81659	RES 2.2K 1/10W
R82	4822 116 82936	RES 7.5K 1/10W
R83	4822 116 82403	RES 6.2K 1/10W
R84	4822 116 81664	RES 270 1/10W
C71	4822 126 11413	CAP 0.1U
C72	4822 126 11414	CAP 0.01U
C73	4822 126 11415	CAP 0.15U

SWITCH BOARD ASSEMBLY

SW1	4822 276 13073	SWITCH